VOL. I. NO. 4 PRICE. 15 CENTS JUNE 15, 1911

THE COMMERCIAL CAR JOURNAL

FLEXIBILITY, or the ability to accommodate itself to any conditions, is a prime requisite in a motor truck.

FLEXIBILITY is **not** a happenstance. It is **there** or it **isn't,** and if there, it was **put into the truck by the designer.**

Note the FLEXIBLE design of the UNIVERSAL.

Motor Unit—Three point suspension, allowing perfect flexibility under severest conditions, as when one wheel drops into a rut.

Radiator—Spring mounted, taking up all vibration and jar.

Jack Shaft Differential Clutch Unit—Three point suspension, preventing any disalignment of clutch, and insuring perfect flexibility of the entire unit under all strains of load.

Radius Rods—Rear axle radius rods hung by cardan joint principle, preventing all strains to rods and bearings under roughest road conditions.

UNIVERSAL MOTOR TRUCK CO., 507 THEODORE ST. DETROIT, MICHIGAN

PUBLISHED THE 15TH OF EACH MONTH

CHILTON COMPANY

MARKET & 49TH STS. PHILADELPHIA

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NON-GRAN

BEARING BRONZE

"The High Price Bronze that Saves Repairs"

The Bearings of your Trucks are small parts, but they are probably the most vital in determining the Truck's efficiency and its ability to give you constant service.

THE BALDWIN LOCOMOTIVE WORKS in replacing the wornout bearings in their entire fleet of Swiss "Saurer" Motor Trucks used NON-GRAN *exclusively.* They have to foot the up-keep bills on these Trucks and, more important still, they have to keep the Trucks on the road day and night every day of the year. They chose NON-GRAN in spite of the fact that its first cost is about twice that of any other bearing bronze made.

¶ NON-GRAN High Speed Bearing Bronze differs radically from any other bronze made. Because of its dense structure and extraordinary cohesive toughness, NON-GRAN will not—it cannot—granulate. No amount of frictional stress can separate its component parts. That is why Bearings of NON-GRAN retain their original surface polish throughout their entire life. NON-GRAN will resist and withstand impact and pressures that would put any other bearing bronze out of commission, and will not weaken or depreciate under any condition of service.

¶ The open, loose-knit structure of ordinary bearing bronzes is responsible for countless automobile troubles and for heavy repair and renewal expenses. Flaking off is a characteristic weakness of most commercial bronzes. This in itself should be enough to prohibit their use on motor cars. Any bronze that flakes or granulates soon saturates the lubricating oil with minute metallic particles, causing undue wear, not only to the part itself, but to all other parts of the motor reached by the metallized oil. One need not be a mechanical engineer to appreciate the harmful effect this oil is having on every working part of the motor.

¶ If you are a Motor Truck Manufacturer or a Motor Truck User, we shall be very glad to hear from you and give you particulars in full about NON-GRAN High Speed Bearing Bronze which is now being so largely and so successfully used.

¶ NON-GRAN is built for ultimate economy,—*not* to meet a selling price. Write us now asking for full particulars.

AMERICAN BRONZE COMPANY

BERWYN, PA., U. S. A.

THE PUBLISHERS' PERSONAL PAGE

By C. A. MUSSELMAN

Much to Learn

It seems as if there is no limit to the number of interesting and instructive articles which may be written about the Commercial Car. The field is so broad and there is so much to be brought to the attention of our readers that there are no idle moments for our Editorial Staff.

It matters not whether you are an owner or a prospective buyer of commercial cars; whether you manufacture or sell commercial cars or any of their component parts and accessories, the contents of the COMMERCIAL CAR JOURNAL will be interesting and helpful to you. In this issue a large number of different subjects are dealt with in addition to the articles which appear in the regular departments under the heads of "Among the Manufacturers," "News of the Dealers and Garages," etc.

Dumping Bodies

An all-absorbing subject at present is the application of the dumping body to the commercial car. Our Managing Editor, Mr. E. S. Foljambe, has been giving a great deal of time to this particular feature and therefore has prepared an article of more than ordinary interest and importance, and supplemented it with an editorial under the heading: "Why Not Use the Motor?" in which is pointed out that the motive power of the motor car should be used for operating dumping bodies and for other purposes, in addition to propelling the car.

"Not Too Much Johnson"

Mr. Wm. J. Johnson contributed the following special articles: "Minimum of Load Handling Essential if Satisfactory Service is Desired." The coal wagon and its advantages are dealt with principally in this installment. "The Commercial Car for Long Hauls: How It Solves the Freight Problem." Examples are given to prove the statements which are made and it shows how the commercial car can be used to take the place of shipments by rail, the economy being chiefly on account of the numerous handlings and transfers which are unnecessary by the latter method. "A Simple and Effective System of Keeping Track of Commercial Cars"—of interest to any one who owns and operates more than one car.

Taxicab Data

Mr. D. R. Hobart gives us his second installment of "Taxicab Service, Organization and Maintenance." Although intended principally for Taxicab Companies, the information is of interest to all commercial car users.

IF

If you—who are now reading this—are not a subscriber, we earnestly ask your consideration of this publication, with a view to forwarding us $1.00, with instructions that we send you the COMMERCIAL CAR JOURNAL for one year.

The contents of this issue will convince you that expense is not spared in our efforts to get together the best information available and to give readers the sort of articles which will be helpful as well as interesting.

Remember, the subscription price is but $1.00 and all you need to do is to send that sum in either currency, stamps, money-order or check, with a brief statement that you wish the CCJ sent to you for one year.

Address your letter to the COMMERCIAL CAR JOURNAL, Market and 49th Sts., Philadelphia, and please do it to-day, before you forget, for it will be a mutually profitable transaction.

Electric Department. Dealing with the subject of Electrics in this issue, there has been incorporated a very comprehensive article on commercial cars now used as Electric Lamp-Trimming Wagons in New York and Philadelphia; also a brief report of the recent joint meeting of the National Electric Light Association of America, and the Electric Vehicle Association of America, at New York.

Tires. One subject which is of never-failing interest is that of tires. The difference of opinions, plus the varied experiences of manufacturers and users make this question a rather unsettled one. In this issue there is considerable data on the use of pneumatic tires on trucks. Certain classes of commercial cars use pneumatic tires almost entirely, especially those which are used for Fire Department service, where high speed is required; and as some of these fire trucks are in weight almost equal to vehicles carrying three-ton loads, the use of the pneumatic is watched with much interest.

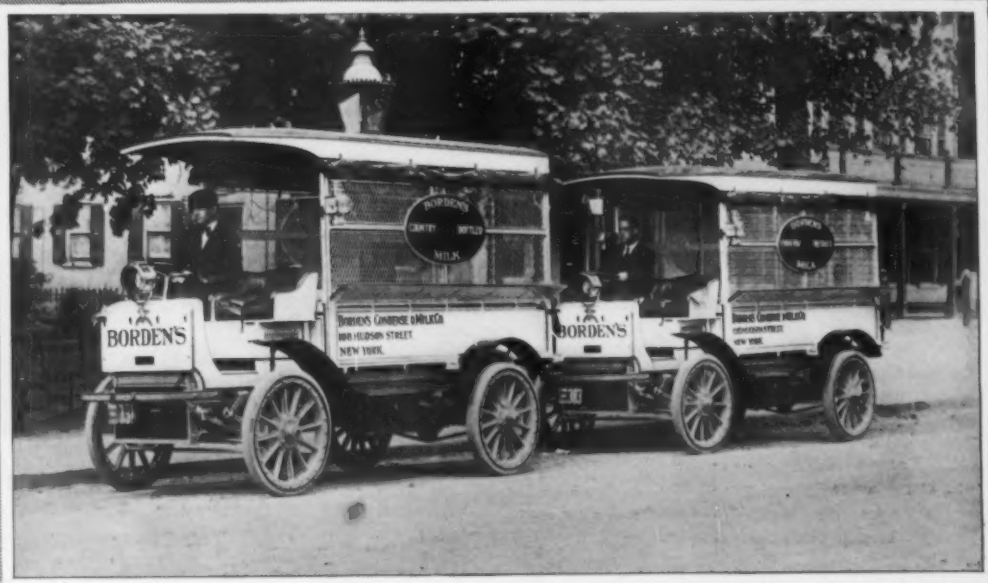
Newspaper Delivery. Among the most progressive newspapers in America are the "New York Herald," "Brooklyn Eagle," "Portland-Oregon Journal," and "Chicago Evening American." The growth of the automobile delivery service of these newspapers and others is recorded in a special article under the title "How the Commercial Car Assists in the Delivery of Newspapers."

Accessories Department. In this section is a review of lamps and horns suitable for commercial vehicles.

From Across the Water. Our Foreign Correspondent gives us the best European practice in lighting apparatus, which is in the nature of a supplement to the review of American lamps which appears in this issue. The Foreign Department contains further, a description of a Berlin motor sprinkling cart, with individual spray controls, which sprinkles the entire width of the street at one run; also notes of interest.

Car Descriptions. This month the cars described include the "Speewell Commercial Car," manufactured in Dayton, Ohio; "The Federal Motor Truck," made in Detroit, Mich.; the "Lansden Electric," manufactured in Newark, N. J.

The Autocar



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SUBSTITUTE an Autocar for your horse drawn vehicles before the hot summer season has advanced. One Autocar will replace many teams. Actual tests have proved that twenty Autocars will do more effective work than one hundred horses.

Continuous Efficiency Guaranteed

Write for Commercial Car Catalog No. 3-C.
Pleasure Car Catalog No. 4-C.

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ARDMORE, PA.
MANUFACTURERS OF COMMERCIAL AND PLEASURE MOTOR VEHICLES
(Established 1897)

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428-430 West 19th St.

BOSTON
Beacon St. and Commonwealth Ave.

The Commercial Car Journal

VOLUME I. PHILADELPHIA, JUNE 15, 1911 NUMBER 4

National Efficiency and Economy Competition—

A Real Commercial Car Competition Which Does Not Take the Trucks Out of Service and Costs Nothing to Enter

THE DETAILS of the National Efficiency and Economy Competition, which will start in August and continue for six months under the auspices of the COMMERCIAL CAR JOURNAL, are practically complete. The various men who will act on the committees and who will be judges of the contest have been appointed. In the May issue the names of the officials were published, these being headed by President Robert P. Hooper, of the American Automobile Association, as Honorable Referee.

is made, the car may be kept out of service for several days. In the National Efficiency and Economy Competition the car remains at its daily work and is actually made to do better service by having been entered. From records turned in the performance of the cars will be judged, everything reported on the blanks being taken into consideration, thus giving every car a chance.

Entries Now Being Received

Although this competition does not begin until August

One of the Mammoth Seven-Ton Alco Trucks Entered by Chas. W. Young Company, Philadelphia, used in hauling soap from their factory and warehouses, through the busiest portion of the city to the docks. As high as eight to ten trips per day are made, the work being that of three double teams.

M. Del Collo's Autocar; a recent entrant. This machine is used in fruit vending and covers daily an enormous territory, working from Lansdowne, Pa., a Philadelphia suburb, as a center. Its daily work is such that horses would be out of the question.

The National Lead Company's Saurer Truck, which carries from 9,000 to 10,000 lbs. per load, the daily mileage being thirty, and the work accomplished equal to that of two to three teams.

First Event of Its Kind

For the benefit of those who are not already familiar with this new kind of competition, we will say that this contest is not for a day or a single run, in which case some of the poorest cars often show the best records, but is to cover a period of six months during both summer and winter weather, showing the performance of the cars in actual daily service; not doing spectacular stunts to be judged by some outlandish formula that evolves a winner out of the least efficient entrant. Commercial car parades and all other contests yet planned have taken the cars out of the hands of the merchant for a longer or shorter period, and if a technical examination

1st, entries were received by us as soon as the first circulars in regard to the competition were mailed, even before all of the various detail arrangements had been completed. Entries are now being received and we urge all those who have been using commercial cars for some time, to enter their various machines, and especially we urge those who have just purchased commercial cars to enter them as it is to their best interests that their drivers operate as carefully and economically as possible.

Cash Prizes to Drivers, Silver Trophies to Owners

One thousand dollars in cash is offered in prizes, to be distributed among the few winning drivers in their various

classes, and silver trophies will be awarded the owners. Here is a direct incentive for each driver to handle his car as carefully as consistent with the service in which it is employed. Nor does it greatly increase their labors, as a small pocket pad is furnished by the COMMERCIAL CAR JOURNAL upon which the driver keeps a record of but a few items each day. The form of this pad is as follows:

Driver's Daily Report Pad

Entry No. Gasoline Car No. Date
Gasoline used—gallons, quarts and pints
Oil used—gallons, quarts and pints
Grease in pounds
No. trips
No. deliveries
No. pounds delivered
Total miles traveled
Total time in service
Amt. Ferriages & Tolls
Sundry Expenses
Remarks on unusual conditions
Driver's Signature

A similar blank with the quantity of current used in charging is provided for the electric cars. These few items should be kept by any firm using commercial cars whether the cars are entered in a competition or not; entry of the cars into such a competition as that which we are now planning, and which will begin August 1st, will give an incentive to the drivers to keep such daily records and get them in the habit of doing so.

These slips are turned in each night to whoever is in charge of the delivery service, then posted on a Weekly Report Sheet, which we supply entirely free of charge to those whose commercial cars are entered. As these weekly sheets are in duplicate and bound, the owner of the car has a complete record of the performance of his vehicle in book form, after the perforated sheets have been torn out and mailed to us. These sheets give the record by which the Governing Committee are enabled to judge the work of the various cars entered. This complete record in book form is worth much to any firm using commercial cars, and is in itself a strong inducement to enter.

Publicity for Entrants

The newspapers are beginning to realize that this is a competition which will really advance the interests of the commercial car and be of infinite help to those using such vehicles. All firms entering machines will be given considerable publicity in the daily press, and through our Contest Publicity Department these notices will appear in many of the local papers in their own vicinity. All those desiring to enter their machines should write the COMMERCIAL CAR JOURNAL at Philadelphia for entry blanks for each car. Although there are yet six weeks before the beginning of the contest merchants are urged to write for blanks at once to insure their cars being properly entered.

The cars will be separated into divisions and classes, so that those working under approximately similar conditions will be in the same class.

Judges located in every large city throughout the country will have general supervision of the competition in their vicinity, and all questions arising during the competition and final awards will be made by the Referee, assisted by the Governing Committee. Thus the results are based on the judgment of a committee of disinterested experts who are not connected in any way with any of the competitors or with any concern manufacturing commercial motor cars or parts entered in the competition.

The Referee reserves the right to refuse any entry.

All communications and all entries should be made to the COMMERCIAL CAR JOURNAL, 49th and Market Streets, Philadelphia, and whenever possible a good photograph of the entered car should be sent in for use by the Contest Publicity Department.

THE "EXAMINER" ENDURANCE CONTEST

The Los Angeles *Examiner* recently conducted an endurance run covering a distance of one hundred and sixty-five miles. The route included boulevards, sand, waterwashes, country roads, steep and winding grades, sharp declivities and city pavements. The trucks encountered the full assortment of conditions that any buyer will ever meet, and for that reason the run is of great value to prospective buyers.

The run was governed by the A. A. A. rules, which are very exacting. Eighteen commercial cars entered the contest, comprising the Hupmobile, Flanders, Brush, Buick, Hart-Kraft, International, Faytag, Chase, Reo, Franklin, Sampson, Randolph, White, Kelly and Avery. The results of the run show that eight cars finished with perfect scores as follows: Brush, Buick, International, Franklin, Randolph, Chase, White and Kelly. The winners were: Five hundred pound class, Hupmobile; 600 lbs., Brush; 1000 lbs., Buick; 1500 lbs., Chase; one ton, Franklin; one and a half tons, White; two tons, Kelly; four tons, Sampson. The cost of operation per ton mile ranged from $.0158 for the White to $.0895 for the Flanders.

The troubles which caused penalties to be imposed were mostly minor ones, being a broken muffler (Hupmobile), taking on water and adjusting oiler (Flanders and Buick), fell in ditch and had to clean carburetor (International), broken chain (Faytag), bent axle and ran out of gasoline (Chase), inefficient footbrake (Reo), ran out of water and had to adjust clutch (Sampson), and had to fix chain (Avery).

MEETING OF THE SOCIETY OF AUTOMOBILE ENGINEERS

The Society of Automobile Engineers will hold its annual summer meeting on June 15th at Dayton, O. About five hundred engineers engaged in the automobile and kindred industries will assemble at the Algonquin Hotel and occupy the rest of the week in sessions devoted to business, professional discussion and recreation.

The following papers will be read: "The Question of Long vs. Short-Stroke Motors," by Justus B. Entz; "Long Addendum Gears," by E. W. Weaver; "Elements of Ball and Roller Bearing Design," by Arnold C. Koenig; "Worm Gears and Wheels," by E. R. Whitney; "Rotary Valve Gasoline Motors," by C. E. Mead; "Oversize Standards for Pistons and Rings," by James N. Heald; "Some Points on the Design of Aluminum Castings," by H. W. Gillett. One evening will be devoted to discussing subjects relating to commercial cars.

Mammoth Truck Parade in Philadelphia

PROBABLY the largest and most imposing parade of commercial cars which has yet been held in this country was successfully conducted on Thursday, June 8th, by the Philadelphia *Inquirer*, assisted by the Philadelphia Automobile Trade Association, in Philadelphia. Over three hundred commercial motor cars, displaying an infinite variety of sizes, types and body designs, were represented. The parade was divided into sections, each headed by an enormous truck acting as a band wagon and carrying musicians.

Head of the Commercial Car Parade Passing the Mayor's Reviewing Stand at the "Inquirer."

The leading section consisted of the largest trucks, there being vehicles of as high as seven tons capacity. As these vehicles necessarily ran at a slower speed than was possible for some of those which followed, this very wise arrangement prevented the line from becoming separated. Throughout the entire line of march, which passed through the busiest sections of the city, the organization of the parade remained intact, and the expert manner in which the police handled the affair was noticeable. Waiting their opportunity until the trucks ahead stopped for a minute, they would rush the traffic through from the intersecting streets, so that business was not interfered with and yet the line of the parade was not broken up. After traversing the congested districts, such as Market street, Front street, and Ridge avenue, the parade came down Broad street, around City Hall, west on Chestnut street, through the Park, the majority of the participants parking their cars at appointed places at Belmont Park, where the machines were inspected by groups of interested business men during the afternoon. A lunch was given by the *Inquirer* to all those present.

The business section of the city was decorated in honor of the event, and to many the parade was a revelation as to the advancement which the commercial car has really made in the last two years. On every side expressions of surprise were heard as to the smooth running, enormous loads carried and the variety of uses to which the trucks were adapted. There were small parcel delivery wagons of a few hundred pounds capacity up to the largest brewers' trucks. The Bellamore Armored Bank car, the new S. P. C. A. water wagon, which is an electric, some unusual tank wagons, a funeral car, adapted for suburban funerals and arranged to carry all the mourners as well as the casket, were among the unusual features.

The funeral car is arranged to take a casket back of the front seats, the rear of the car having what appears to be an enormous limousine body. It is stated that this car has a capacity of thirty-six persons. The Ballamore Armored Bank car is a novel vehicle suitable for distribution of moneys to outside workmen, and is a miniature bank on wheels, having all the features necessary. The exterior is armor clad, and the windows are fitted with burglar alarms; in other words, the vehicle is capable of resisting an attack from without.

Much credit is due the *Inquirer* and the committee of the Philadelphia Automobile Trade Association and the police, for the efficient way in which the entire affair was conducted. Chief Marshal Bartlett headed the parade in an electric. The members of the P. A. T. A. committee and marshals were: Charles S. Spencer, Emlen S. Hare, C. Douglas Bartlett, Thomas S. Megear, J. F. McIntyre, W. H. Metcalf, Evans Church and W. S. Miller.

Parade Coming Down Broad Street Toward the City Hall, showing the car carrying the committee at the head followed by some of the mammoth trucks.

A Section of the Commercial Car Parade Passing Down Market Street, showing some of the large tank wagons and other trucks with unusual bodies.

THE LATEST WATER WAGON

The Woman's Pennsylvania Society for the Prevention of Cruelty to Animals has just put in service the first automobile horse-watering wagon in existence. The general appearance of this vehicle is shown by the accompanying illustration. It is an electric, built by the Commercial Truck Company of America, of Philadelphia, and has a carrying capacity of something over 120 gallons of water and carries

The First Electric Water Wagon

A unique electric vehicle installed in Philadelphia, by the Woman's Pennsylvania Society for Prevention of Cruelty to Animals, to be used in congested districts for the relief of thirsty horses.

a large number of water buckets. At the rear is a draw-off similar to those of an oil-tank wagon. The crew consists of two men, the chauffeur and the attendant, who waits upon thirsty horses free of charge. The operators have not been forgotten, as there is an ice-water tank for their use.

The wagon is to be used in the very congested business districts where the ordinary S. P. C. A. water stations might be justly said to interfere with traffic. The wagon is a memorial of Mrs. Anna L. Lowry. The consummation of the plan for installing such vehicles is due to the money which was left by Mrs. Lowry, and the energy of Mrs. B. Bedell, chairman of the committee that had this work in charge. It is hoped that the use of such wagons will be copied by the societies of other cities just as the water stations which were instituted by this society, in 1906, have been copied in other cities.

BOSTON TRUCK RUN WILL TAKE PLACE IN FALL

The Boston Commercial Motor Vehicle Association has decided to postpone its truck run until September. As originally planned it was proposed to hold the run about the middle of June, but there was a delay on account of lack of information from the governing body in motordom regarding the rules that apply to competitions of this nature. The committee could not go ahead and make definite plans without a proper knowledge of the rules and the A. A. A. officials were so busy on other matters that they were unable to give attention to the Boston situation.

RECORD MADE BY A DAYTON TRUCK

What is probably the longest and most successful cross-country run ever made by a fully loaded motor truck, was concluded recently when a three-ton Dayton truck, made by the Dayton Auto Truck Company, of Dayton, Ohio, carrying three tons of soap from Swift & Company, Chicago, delivered its consignment of freight to James Butler, of New York.

The truck left the Palmer House, in Chicago, on the morning of May 15, and when its crew checked in at the Imperial Hotel, New York, it made a record of twelve days and two hours, beating the tentative schedule that was laid out for it by over three days.

During its passage between the two cities the truck broke through two bridges, and four times planks had to be laid over others to keep the huge vehicle which, with its load, weighed close to seven tons, from dropping into rivers and creeks.

The roads were deep in mud up to the hub caps at times, and a detour had to be made from Little Falls to Fort Plains, N. Y., when only twenty-eight miles were covered after ten hours' hard work.

Despite the bad conditions of the roads, the truck came through without any mechanical trouble or replacements, and its Diamond tires were not touched, from the time the truck left Chicago.

Charles Spohr and A. H. Bennett alternated in driving, while G. B. Aldrich blazed the way in a pilot car.

The route followed from Chicago was via South Bend, Toledo, Cleveland, Buffalo, Rochester, Syracuse, Utica, Albany and Poughkeepsie to New York. As the odometer showed a total mileage of 1,132, the truck averaged one hundred miles a day with about ten hours' driving, which is a remarkable performance.

After concluding this part of the trip the truck continued on to Philadelphia, from where it will go to Pittsburg and on to the factory, at Dayton.

THE DURABLE DAYTON
MFG'D. BY THE DAYTON AUTO TRUCK CO. DAYTON OHIO
CHICAGO TO NEW YORK RELIABILITY RUN
LOADED WITH 6000 LBS SWIFT'S PRIDE CLEANSER
CONSIGNED TO JAMES BUTLER NEW YORK CITY

Dayton Truck After Delivering Its Load

COMMERCIAL CAR CARRIES HORSES HOME

The Hebard Express and Van Company, of Chicago, recently had a contract for a household removal to Downer's Grove, Ill., twenty-seven miles from the city, which required the services of a horse-drawn van and a commercial car.

The usual procedure with a horse-drawn vehicle after a trip of this kind would be to put the horses in a livery stable, the driver going to a hotel, and making the return trip the next day. In this instance the next day fell on Sunday, which would have meant time and one-half for the driver during his absence from the city. Therefore, the two horses were loaded into the commercial car and the horse-drawn vehicle was attached as a trailer. The return trip of twenty-seven miles was made in good time and the horses were placed in their barn at nine o'clock Saturday night.

About a week previously, one of the horse-drawn vans was overturned on Hubbard's Hill, which is twenty-two miles from the heart of the city. One of the horses was killed. Two commercial cars were on the same job. One of them took the load from the overturned horse-drawn van and delivered it. The dead horse was then placed in one of the trucks, the live horse took his position in the other and, the horse-drawn van being attached as a trailer, the return trip was made to the barn at Winchester and Ogden avenues.

EXAMPLE OF MOTOR FIRE TRUCK'S SUPERIORITY OVER HORSE APPARATUS

A recent fire in the township of Malden, a suburb of Boston, Mass., brought out very forcibly the distinct advantage of motor driven fire apparatus over horse-drawn vehicles.

In the case referred to an alarm was rung in from the very inflammable foreign quarter during the worst road conditions the town has ever experienced. The location of the fire alarm box was about equally distant from three fire houses, two of which were occupied by horse-drawn apparatus, and the third by a Knox motor driven combination hose and chemical wagon. The motor car made the mile run to the fire, used the chemical stream and put it out before the first horse-drawn machine arrived, seven minutes after the auto reached the scene.

In speaking about the run the fire chief said, "There was a high wind blowing that night and, knowing how inflammable those closely packed buildings always are, we would have had a very hard fight on our hands had the fire got a fair start in those extra seven minutes or more before the horse-drawn apparatus could be brought into play. The promptness of the motor combination wagon unquestionably saved a big property loss and several lives."

INDIANAPOLIS TO HAVE MOTOR 'BUS LINE

The Rapid Transit Motor Company has been formed in Indianapolis, Ind., with a capital of $150,000, to establish a motor 'bus line. R. D. Campbell, a New York promoter, is the prime mover in the new venture, of which Jas. T. Eaglefield is president and general manager. Six 'buses are scheduled to be in operation by July 15th, with others to follow. Six minutes service will be given, and the 'buses will have two decks with a seating capacity of 42. The-pay-as-you-enter system will be used, the entrance being on the side, near the driver, who collects the fares as well as drives, making the 'bus an economical one-man vehicle.

PHILADELPHIA COMMERCIAL CAR DEALERS ORGANIZE

On Tuesday, June 13, there were gathered together at an informal luncheon all of the motor truck dealers of the city of Philadelphia. Plans were perfected for forming a permanent organization, which will probably be known as the Motor Truck Club of Philadelphia. Such organizations are already in existence in New York, Chicago and Boston. Mr. E. S. Foljambe, of the COMMERCIAL CAR JOURNAL, was elected temporary chairman and outlined the purpose for which the meeting was called. An organization committee was appointed by the chair, to report at a meeting Tuesday, June 20, when a permanent organization is to be effected.

COMMERCIAL CARS FOR LUMBERMEN

The motor truck has invaded the lumber district of San Francisco. Owing to the extra lengths and the immense weight of some of the big pine timber handled by lumber firms, the motor truck, up to the present time, had not been designed to meet with the exacting requirements of the lumber dealers. It remained, however, for Frank Barrett, of Pope & Talbot, lumber dealers, to suggest that the front wheels of the ordinary lumber wagon be removed, and the front end of the load then mounted upon the rear end of the ordinary Knox four-ton truck. The loads which were handled contained forty-five hundred feet of rough lumber, weighing nealry seven tons, and about three tons of this was carried by the motor truck, and the remainder rested upon the rear wheels of the lumber wagon. No difficulty was experienced in obtaining good speed, and the loads were dumped with the ease of the ordinary lumber wagon. Comparisons show that an ordinary truck can accomplish more than three times the amount of work of the four-horse-drawn lumber wagon.

COMMERCIAL CAR USED IN DAIRY BUSINESS

The Kenwood Dairy Company, of St. Louis Park, a suburb of Minneapolis, has in service a specially designed truck which is fitted with a body designed to meet climatic conditions of summer and winter and at the same time protect the driver and the load carried. The truck is a regular three-ton Reliance model with sliding-gear transmission and double side-chain drive. The driver's cab is fitted with hinged doors and adjustable windows, so that the operating conditions may be made pleasant at any season of the year.

PROVES VALUE IN FOREST FIRES

During the recent forest and brush fires in many parts of Massachusetts, motor fire apparatus proved of great value, not only in preventing loss, but in saving the other equipment. The motor apparatus, in most cases equipped with chemicals and carrying brush fire-fighting apparatus, was able to reach fires in their incipient stage or to get about quickly on different sides of an advanced fire, so that it is reported in many instances there has been prevented much loss of property.

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WHY NOT USE THE MOTOR?

It is surprising how slow the development of certain mechanical devices have been, and yet how rapid has been the perfecting of certain other mechanisms. The man with his eyes so close to the design that he cannot see beyond the paper is often a hindrance to the advancement of large developments, although the direct means of bringing into use smaller and perhaps less important devices. It often happens that an outsider steps in, one who has not been connected with that line of work at all, and in an off hand manner remarks, "Why do you not do so and so?" The force, aptness, and pertinence of his remark appeals at once to the near-sighted, intent-on-one-purpose designer, and he wonders why in the world he never thought of that himself.

Some such conditions as these now exist in the design of bodies and appliances which will make possible the innumerable applications of the automobile or commercial car to business purposes. The chassis always contains a motor, yet elaborate bodies for special purposes are placed on this chassis and arranged to be hand cranked into various positions, or to be dumped by the muscular effort of the driver, at a great loss of time. Fire engines with 60 and 90 h. p. motors to propel them are often also fitted with a complete steam engine plant duplicating power equipment, incumbering the body and making a heavy lumbersome piece of apparatus. Apparently the designer's last thought is of the fact that he already has a sufficient power plant—why does he not use it?

Innumerable instances can be pointed out of designs in which the engine of the truck can be used most advantageously for hoisting, dumping or shifting bodies, yet no effort whatever has been made to utilize the power plant already installed and waiting to give efficient and instant service. It is high time that commercial car designers realized that the ultimate, successful, special duty truck will be one of greatest simplicity and the least duplication of working parts. This means that the designer must in every case, realize in the beginning that he has at hand sufficient power, when properly geared, to do almost anything desired. Realizing this fact, the special body should be designed to be motor operated by some simple clutch connection to the power plant of the vehicle itself. As a rule the motor is standing idle when loads are lifted, goods shifted or bodies dumped, and there is no reasonable excuse why the engine should not perform these functions. The connections can be made fool proof, and what would ordinarily be the work of several minutes or even hours can be done in the twinkling of an eye.

We earnestly urge co-operation between the truck body makers and the designer of the chassis with a view to the general use of the propulsion power plant for supplying the energy for all kinds of operations requiring at the present time hand manipulation. As it were, a new field of invention is here open and even the most superficial cannot help but foresee the great saving of time and labor, to say nothing of money which must necessarily follow the development and use of such devices. As a last word to the designers, "Don't forget that the chassis already has in it a prime mover."

A WARNING TO AMERICAN COMMERCIAL CAR BUILDERS

At this time the attention of the entire world seems to have been drawn toward the commercial car and its possibilities; a large percentage of the well-known manufacturers of passenger cars are experimenting or developing just as rapidly as possible some form of commercial car. Unseemly haste appears to be the rule rather than the exception and the demand on the part of the public and the desire on the part of the maker for a cheap car, is undoubtedly leading to the construction of many machines which will be a detriment to the industry of the country.

The average American is always in a hurry, he seldom takes time for careful and due consideration. He eats in a

hurry, he works in a hurry, he hurries to the ball game—in fact, he is in a hurry no matter what he is doing or where he is going. This state of eternal rush into which he works himself, makes itself felt in the cars which he turns out. Mechanically he is a genius. Full of ideas, he can invent machine tools, and can systematize methods of production until cars can be turned out at an astonishingly low cost, and are yet serviceable for a time.

In the automobile business this has resulted in the manufacture of large numbers of premature commercial cars; by "premature" we mean machines in which the design was never given the careful thought and attention that it should have, nor the material or parts the exhaustive tests they should have to prove their serviceability, before being placed on the market. It is the American disposition to want something cheap, but capable of doing the work required. As a rule, the American purchaser feels that he knows something about mechanics. He therefore looks over the machine and is willing to take a chance on his judgment of the vehicle, even when he cannot have his judgment backed up by actual demonstrations or performances.

Knowing all these things, promoters, machinists and others equally unfit to design, have obtained capital from those anxious to share in the profits which it is believed will be so easily reaped in this new industry, and have hurriedly gotten together so-called commercial cars. Without testing out each and every construction used and making sure that the design will meet the requirements, these cars are turned out in large numbers and thrust on the market. The American buyer, with his natural tendency toward taking a chance, purchases these vehicles and proceeds to test them out in his own service. It is, of course, certain that such manufacturing concerns will soon go under, but their product will continue to drag down the good name of the American car. Other manufacturers are making the old mistake of simply rearranging or slightly changing a chassis which has proved fairly satisfactory as a pleasure car. This is one of the worst errors that can be made, and sooner or later brings ruin upon the company which adopts it.

These cars sell for a low price, however, and manage to do fairly well for a short period, which results in a double deception, that of the purchaser and maker. Both are deluded into the temporary belief that such a commercial car is satisfactory, when in reality it is far from it. These machines are not only purchased in our own country, to the ultimate detriment of our commercial cars in general, but are very largely exported and purchased by unsuspecting foreigners, who are led on by the low price and the very pleasing exterior appearance. For a short time there will be a large sale for these slap-dash constructions, with an inevitable reversion of feeling, which then makes it very difficult for legitimate manufacturers of high-grade goods to sell their product. Such cars simply educate the buyer to a low price, and leave him with a feeling that, although the particular car he had did not make good, some other one at an equally low price might.

Although it is impossible to prevent the production and marketing of such commercial cars, still the two well-known organizations of manufacturers might, to a certain extent, control their production by making admittance of any manufacturer into either organization dependent upon the favorable report of a technical commitee on his product. Such an action on the part of the organized manufacturers would tend to uplift the standard of the American commercial cars and those abroad.

TRUCK PURCHASER REQUIRES COSTS FROM AGENTS, BUT KEEPS NO RECORD AFTER PURCHASING

The average prospective commercial car purchaser usually makes life miserable for the truck salesman, by demanding all kinds of figures in regard to the cost of up-keep. He talks of nothing but cost, and one would think that satisfactory delivery of his merchandise was not a feature in his estimation.

This same man, after purchasing a motor delivery vehicle, seems suddenly to forget all about cost of operation and keeps no itemized record of such costs and knows very little about what his delivery is actually costing since the introduction of power commercial cars. Yet this same performance is gone through with every time a car is purchased. If the owner and user of a commercial car cares so little about the actual cost of operation, when he finds that motor trucks will do the work more satisfactorily than he has had it done before, why is he so strenuous with the agent on the point of cost? It would seem advisable for the salesman to talk to the purchaser less on the subject of the actual cost of maintenance and more as to the best methods of using the new vehicles, and as to how he can enlarge his field of operation.

Commercial cars have been used, are used, and will continue to be used in certain places, where they cost more to operate than it cost when horses were employed. But in all such cases, there are so many marked advantages in the use of these power wagons, that nobody thinks of going back to the old methods. In the majority of cases, however, commercial cars will do the work at a less cost than by former methods. These facts do not seem to be considered by the purchaser after the car has been put in service; the machines are running satisfactorily, the goods are being delivered, the business is being built up, patrons are better satisfied, new districts are being catered to that were entirely inaccessible before, and the general work of the commercial car is such as to please and satisfy the purchaser. Under these circumstances he takes very little account of what it actually costs him to do the work. This being the case, it is too bad that the sale of the truck, in the first place, should be made so entirely dependent on the ability of the salesman to produce figures which will show that the cars are more economical than horses.

It is a very difficult matter to compare the actual cost of motor-truck maintenance to that of the horse maintenance. No sooner is the truck installed than a new order of affairs goes into effect and things are done which were never before even considered.

AMERICAN COMMERCIAL CARS IN CANADA

Although the duty on American-made commercial cars seems almost prohibitive, the White gasoline trucks made in Cleveland, Ohio, have been very successful in Canada. Seven White trucks were recently delivered in Toronto alone. It is notable that flouring interests have been purchasers of these trucks, their particular use being to haul flour from the various mills to shipping points. And although the duty makes the cost of the truck fully one-third higher than in this country, the White trucks have been able to show a decided saving over horse-drawn vehicles—not only handling larger loads, but doubling the number of trips per day.

How Commercial Cars Facilitate the Work of Delivering Newspapers

BY E. S. FOLJAMBE

IF THERE is one business more than another in which speed is essential and in which delays cannot be tolerated, it is that of publishing a large daily newspaper. The rapid handling of the various editions—there being sometimes as high as seven in a single day—is an absolute essential. These editions must be rushed to the news stands in the various parts of the city, to railroad stations and docks, in express time. This need of speed early led the newspapers of our large cities to investigate the possibilities of commercial cars for this work. Even in the early stages of the commercial car business some publishers converted pleasure cars to their needs and did a pioneer work by introducing rapid automobile delivery to their substations. True, a few of these pioneers became discouraged, owing to having purchased antiquated equipment or having converted machines which were not suitable for the work; some opposition was encountered with the help, and drivers could not handle the papers as they were not members of certain news unions; this necessitated bringing into service a new set of drivers who did belong to the News Union and who were allowed to handle the papers. Before this an extra man had to be placed on each machine simply to load and unload the neswpapers, thus making an unneccessary expense. However, at the present time most of the large newspapers have from one to a dozen commercial cars in daily service, notable examples being, the *New York Herald;* the *Brooklyn Daily Eagle;* the *Oregon Journal*, of Portland, Ore.; the *Chicago Evening American*, and the *Detroit News*.

An Example of How the Automobile is Displacing the Horse. The large garage seen at the left was formerly the horse stable, and the two experimental cars were housed in the small building at the right; now conditions are reversed; the former stable has been converted into an up-to-date fireproof garage with concrete and tile, steel doors and a large electric elevator.

Large Stable Now a Garage

The largest number of commercial cars in use by any newspaper is the fleet of Locomobiles of the Brooklyn Daily Eagle. The history of the gradual increase in the number of commercial cars used and the accompanying decrease in the number of horses employed is very typical of the steady and sure adoption of the commercial car by the business world. In an accompanying illustration is graphically shown this change as regards the Brooklyn Eagle's service. Here during the past six years of use of commercial cars the buildings for the horses and cars have changed places. The large building shown is now the garage, but was originally the stables, while the small building at the right now houses the few horses still used, but was used as a garage for the first two or three cars installed. Thus we see that the elimination of the horse is almost complete. The stables have been refinished and supplied with concrete floors, large electric elevator and all the appliances of the most up-to-date garage. At the present time there are seventeen machines in service. The upper floors of this now fireproof garage are equipped with machine shops and all the necessary equipment for caring for the commercial cars.

Two trucks were first purchased in 1905, but were too heavy and cumbersome for afternoon delivery, which required very quick service, but were found to be of great value in the delivery of the Sunday morning edition. These cars were followed by another commercial car of lighter type. Experiments were then begun with touring car chasses, putting on a light open body fitted with a carrying box of about 4x6 ft. in size. This machine was more satisfactory, but was at a disadvantage in wet weather. Leather coverings to protect the papers were then devised and experiments finally developed a suitable collapsible top which completely protected the papers during inclement weather. The latest additions to the equipment have been the 30 h. p. Locomobiles with a very light covered body with leather curtains on all sides. These cars have proven very satisfactory, carrying over 4,000 papers or a load of about 1,500 lbs. Ordinarily the covers are all rolled up, so that the driver has an unobstructed view on all sides of the car, facilitating rapid handling in crowded traffic.

The job printing department also uses one auto, which easily does the work of two wagons, and the Eagle advertising men are also supplied with automobiles.

A Few of the Seventeen Locomobiles Composing the "Flying Squadron" of the "Brooklyn Daily Eagle." This installation is interesting, owing to the successful use of pleasure car chassis and pneumatic tires for commercial work. This paper would have to go to press earlier and contain less news if it had to go back to the use of horses.

Cost of Maintenance

The present cost of operating the commercial cars is about the same as for wagons, but the efficiency of the service has been very largely increased. In 1908 the cost of operating one horse wagon was $283.41. In the same year the upkeep of a single automobile was $385.46, the auto costing $102.05 more than the horse. In 1909 the horse cost $287.88 and the auto $306.98, a difference of only $19.10. It will be noticed that the cost of maintaining the horse and wagon remains about the same, while that of the motor car has decreased. At a first glance this looks as though it would cost more to do the work by automobile, but this is decidedly not the case, as the automobiles average 30 miles a day against 10 miles by the horse wagons. By the use of demountable rims, tire trouble has been reduced to a minimum, all the cars being fitted with pneumatics, a necessity on account of the speed.

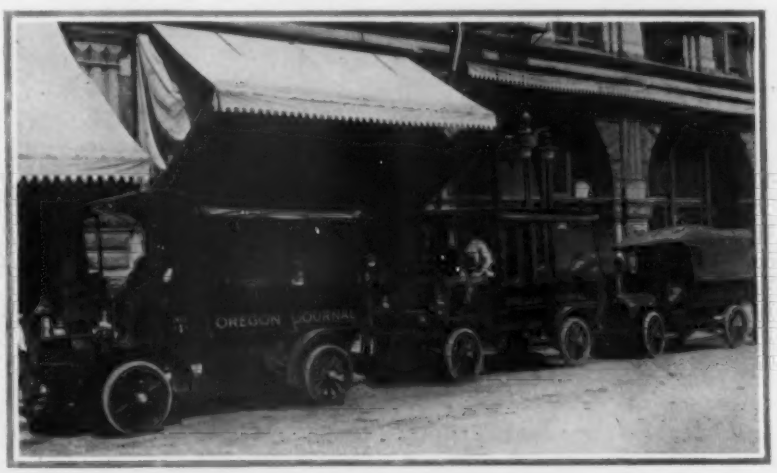
The drivers have usually been recruited from those on the horse rigs and are given instruction both in machine shop and on the road, although competent machinists are employed to keep the cars in first-class condition. Drivers make a report at the end of each day and two cars are usually kept in reserve, one in the shop being overhauled, the other ready for instant service.

No delivery service ever required of the automobile is so exacting as that of a newspaper. No matter what the weather conditions or the state of the roads, the paper must leave the office on schedule time, and every effort is made to get them to their destination on time. Ordinary delivery service required by the city merchant is not so strenuous. During heavy snowstorms in the city, when the streets have been blockaded by a large fall of snow, the *Eagle* has found that the automobiles were infinitely better than wagons or sleighs.

The statement was made that, if this company had to go back to the use of horses, the paper would simply have to go to press earlier and they would not be able to get in the news which they now carry.

The "Herald" Commercial Cars

The *New York Herald* also has a large fleet of commercial cars, which are used almost exclusively for the rapid distribution of their papers in the various parts of the city. There are twelve Renault machines in use and these have been in practically continuous service for over two years. They are equipped with single pneumatic tires on the front, dual on the rear. The service has been very much improved since their introduction, and there has been no trouble whatever owing to breakdowns. The delivery department expenses are also less under the automobile service than with the horse and wagon service as in the past.



Some of the Commercial Cars Now in Successful Use by the "Oregon Journal," of Portland, Oregon

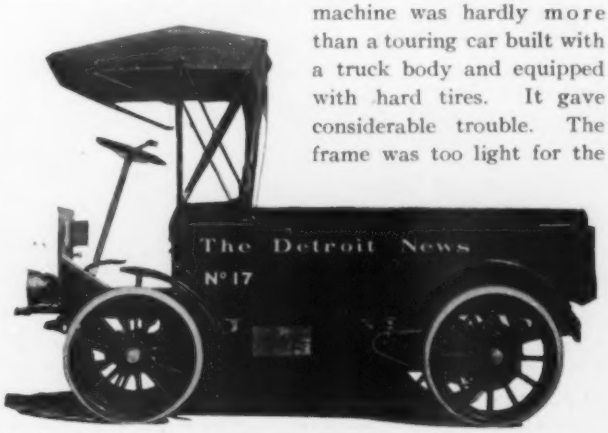
The *Herald* is better located for the use of commercial cars than some of the papers at the lower end of Manhattan, as the traffic is not so congested. The statement was made by one of the New York papers situated at the lower end of Manhattan that they would like very much to use commercial cars but found that in the very congested districts the autos were so delayed by being held up at intersecting streets by the traffic police that they could make better time by giving numerous boys as large bundles of papers as they could carry, these boys taking the subway and the elevated trains directly to sub-stations located near these lines. It was acknowledged, however, that where these peculiar traffic conditions did not exist there was nothing as rapid as the automobile.

"Oregon Journal" Commercial Cars

The *Portland Oregon Journal* is now using eight machines in its circulation service, having introduced them over two years ago. Some of these machines are shown in the accompanying illustration. They were introduced as it was found that, owing to the increase of circulation, the horse delivery service was not adequate, trains were missed and they were unable to handle the papers as fast as printed.

As an experiment they purchased a 30 h. p. touring car with a detachable tonneau. At first they used this machine for carrying light loads to distant points. After experimenting a while it was realized that the automobile could make two, and sometimes three, trips to the depot while a horse and wagon was covering the same distance once. After a few months a second touring car was purchased and used in place of one of the wagons. About this time they commenced to have their first tire and engine trouble. The hard use they had put the first automobile to had told heavily on it and it was a common occurrence to miss a mail train. On one or two occasions they had serious blowouts that delayed the delivery of papers in the residence district considerably. Things began to look discouraging, but they decided to give the auto delivery service another trial. They purchased a one-ton Grabowsky truck in April, 1910. This truck was able to do the work of from two to three wagons and no trouble was experienced with it until September, when a platinum point burned off the coil. This was replaced for 90 cents and since that time there has been no expense for repairs. In October, 1910, they purchased another one-ton Grabowsky. This truck also gave excellent service without costing anything for repairs. With the two Grabowsky trucks and two touring cars they were able to dispense with wagons entirely.

In January, on account of a considerable increase in circulation, they purchased a third truck. Unfortunately this machine was hardly more than a touring car built with a truck body and equipped with hard tires. It gave considerable trouble. The frame was too light for the work it was put to and the engine was not made for use in a truck. However, even with the many petty inconveniences, it proved of great value in transporting papers. While the cost of operating trucks has proven a little higher than the cost for operating with horses and wagons, the statement is made that they would not be without them on account of the rapidity with which a given service can be performed. The difference in the cost is due to this fact. When using horses and wagons they were able to make a contract to have the papers hauled for a lump sum. The contractors' wagons were used by the *Journal* only between the hours of two and six p. m. During the balance of the day they converted them to other uses, while the Auto trucks are idle until 2 p. m. If trucks were used continuously all day, hauling cost would be less than under the old method.



A Detroit Electric Used by the "Detroit News" in the Quick Delivery of its Papers

Under no circumstances would they again use a pleasure vehicle for trucking purposes, and have discarded one of the pleasure cars which they converted two years ago into a paper-carrying auto. On all of the trucks they are using solid tires.

Two of the Commercial Cars Now Doing Excellent Work in Distributing the "Chicago Evening American"

A CONTRACT to feed the animals in Yellowstone National Park is a pretty big undertaking. The transportation of food was a staggering problem when horses were used. Between 10,000 and 15,000 tons of hay and grain are hauled great distances each year. E. H. Sherman, the contractor who has the task at the present time, has begun to supplant the horses with automobile trucks and has placed in service a Sampson one-ton freight motor.

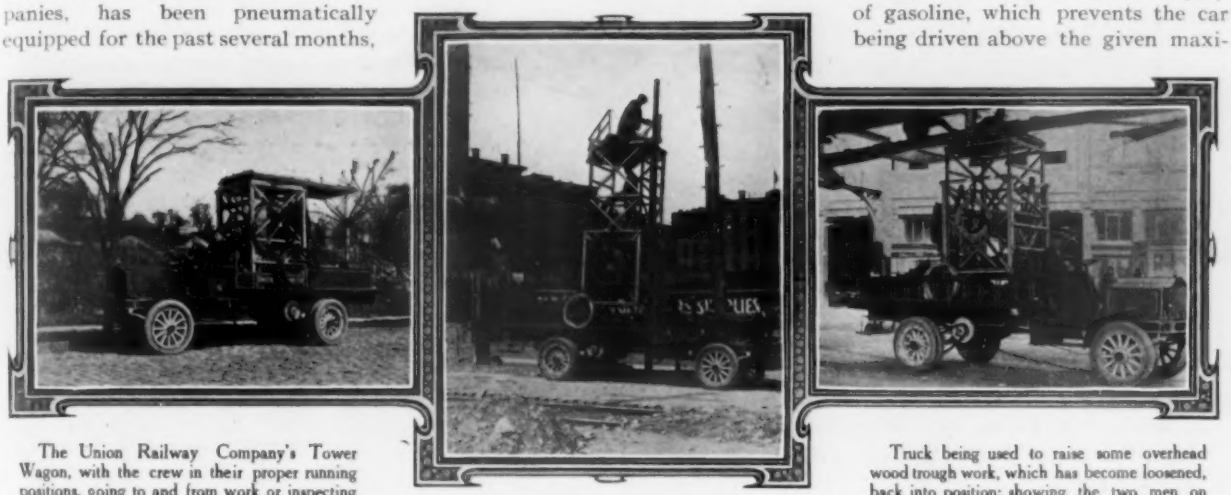
THE MARVEL CARBURETER COMPANY, of Indianapolis, Ind., has been fortunate in securing the services of Humphrey Harrington, who will take charge of the factory. He was a great factor in the success of the Diamond Chain Co., when it attained prominence in the bicycle world, and is well known for his efficiency in factory management.

replaced there is only the cost of a small tire instead of a very large one.

The pneumatic tire on a fire truck is a somewhat different proposition from using a pneumatic on an equally heavy vehicle in any other service, owing to the fact that the truck is likely to stand inactive for a large part of the time, so that instead of the tires wearing out, they may be said to rust out; in other words the rubber deteriorates by age before the tire sees sufficient service to need replacing from wear.

The entire Fire Department of Springfield, Mass., which takes in besides the chiefs' cars, the fire engines, tenders, trucks and hook and ladder companies, has been pneumatically equipped for the past several months, the contract having been awarded to the Fisk Rubber Company.

These tires have undergone the hardest kind of service during that time and, it is said, have given entire satisfaction to the department.



The Union Railway Company's Tower Wagon, with the crew in their proper running positions, going to and from work or inspecting the lines.

The tower raised to its full height. The floor of the platform is about 17 ft., the span wire the men are tightening being 19 ft. 6 in. above the street level. The driver is standing on the bottom floor of the inner tower rearranging the extra rim and inflated tire, which has become unlashed. The running position of this floor is level with the bottom of the truck platform.

Truck being used to raise some overhead wood trough work, which has become loosened, back into position; showing the two men on top of the board work, the tower having been raised about two feet.

Pneumatic Tires on a Heavy Tower Wagon

The Union Railway Company, of New York City, is a street railway company operating about 110 miles of overhead trolley lines on fifty-five miles of streets in that portion of New York City lying farthest to the north and known as the Borough of the Bronx. In order to maintain their overhead wires and cables in operating condition they had to keep from four to six two-horse team tower wagons at work constantly. During winter four were sufficient, and in summer at times six teams were not enough, due to hot weather conditions.

Last year it was decided that the time was ripe for making an initial start with mechanically operated tower wagons and a gasoline-electric, four-wheel drive and four-wheel steer truck, was purchased. This truck was bought for special conditions and service, and was mounted on solid rubber tires, the total weight, without street railway equipment, being five tons, and has been run as far as seventy-five miles in one day of ten hours, and attended three bad breaks in overhead work that occurred within a very short time of each other and would have required three teams of horse-drawn wagons to cover in the same length of time. A speed of twenty miles an hour is easily maintained by this truck.

Having demonstrated that mechanically-drawn tower wagons were an improvement over horse-drawn vehicles, four gasoline trucks were bought for what is termed in street railway work, regular maintenance tower wagons. These have a standard three-ton chassis, having regular Trenton towers mounted on them, and weigh complete with all equipments, including a force of three men, nearly five tons.

There was one serious objection to these cars and that was the question of speed, as the makers flatly refused to consider the sale unless their speed limit, twelve miles on solid tires, was strictly adhered to, control being obtained by means of a governor regulating the supply of gasoline, which prevents the car being driven above the given maximum speed, but does not, of course, have any effect on the control on a down grade.

After considerable discussion regarding speed, the question arose why a faster one could not be given, the answer being that the maintenance costs would be prohibitive; considered from the truck manufacturer's standpoint, and this would not be to the credit of their product.

The next question was: Well, what can be done to obtain more speed? The answer came rather hesitatingly and somewhat dubiously—pneumatic tires if they will stand up and are not prohibitive in cost and maintenance. It was then decided to put it up to the tire manufacturer, and on receipt of a somewhat vague answer, orders were given to equip one of the four trucks with pneumatic tires as an experiment, as a speed of sixteen miles could be maintained with them against twelve on the solid tires.

In order to avoid the carrying of many extra tire parts it was decided to adhere to one size for all four wheels, the front wheels being fitted with single 37 x 5 in. clincher tires with quick demountable rims, and the rear wheels with two of exactly the same equipment, giving a single front and a dual rear, but an interchangeable part for any wheel, all parts being standard. In this connection it might be well to state that the inner tube valves are of the very short inverted type, necessitated by the dual arrangement of the rear tires.

The cars were in service for nearly six weeks before an extra tire, mounted on a rim, was procured, and during that

time only one little fault developed, fortunately at an opportune time, as the running of the car on a flat shoe meant the complete destruction of tube and shoe. This car has now run 1990 miles and the shoes are in excellent condition, having been in service 110 days, or an average of a little over eighteen miles per day, sometimes covering twice that distance, and other times just a few miles, depending on circumstances. The car covers the congested districts as regards street cars. The greater proportion of the pavements are granite block, and are not in what you could call first-class condition. There is a great deal of broken glass to contend with, and on several occasions children have run out into the streets and deliberately thrown bottles under the car, hoping to see a tire punctured.

Dual Pneumatic Equipment on the Rear Wheels of the Boyd Brothers Fire Car. This car is equivalent to a three-ton truck, but can safely attain a speed of forty miles per hour on the pneumatic tires.

No Delays Due to Tires

Lately there have been several small punctures, the last occurring when the wagon was just clear of the car tracks, and was due to the valve becoming loose in the inner tube, allowing the collapsing of the whole tire. This occurred at a time when there was not an extra tire on the truck, as the two spares were in the shop, one for minor repairs and the other for a clear cut 3 in. long, which is hard to explain. This is the nearest the company has come to having a delay on this truck, and they have only had five repairs to tires so far. They do not consider that they are delayed unless the street car line is blocked somewhere and they cannot move the truck, giving a pretty fair margin to work on, although a break in the street car service is very liable to occur at any time and then it would be a serious thing to be without the use of the truck. Drivers are instructed to keep out of the car tracks as much as possible, as although most of the rail is the so-called Trilby type, and is considered to be the rail par excellence for small interference to street traffic, the edges do have sharp places at times and wear a tire very fast. Not only that, but slivers of steel are liable to be picked up at switches, especially on old work, and all in all, it is much safer to keep out of the track except when actually engaged in the work of repairing the overhead wires.

The tires are bought on a 3500-mile guarantee against defects in manufacture, so that the company should receive nearly again as much service as the tires have already given, and the prospects are very good for getting more than that. It does not appear now that the actual costs will be as cheap as the solid tires, but they have every reason to believe that, considering the repairs to the whole truck, the cost will be less with the type they use, top-heavy and necessarily of very light construction. The constant jarring with the resultant renewal of parts must be considered. This truck rides like a pleasure car.

The ordinary crew on the truck consists of the driver, one lineman and one lineman's helper, the last named riding on the rear end to prevent strangers and children from jumping on and off with a liability of damage claims; the lineman riding on the front that he may the more readily examine his overhead wire and structure. The linemen will eventually, some of them have now, received a chauffeur's license so that in case of accident to the regular driver the truck can be intelligently handled until another driver is procured or the day's work be completed.

Keep Cost Record

Keeping an accurate record of maintenance costs is all right and we believe that every commercial car user should keep such a record of what is spent for delivery by his commercial car. This record, however, should not be measured or attempted to be measured by the rule of the horse, which is absolutely inadequate, nor should it be kept for the purpose of comparison with the horse. It should be carefully systematized and expenses recorded for the sake of bettering the service and for the knowledge which the owner has as to which type of vehicle is most efficient in his particular kind of service; also for the knowledge which it gives him as to the competency of his various drivers. This record, in other words, is invaluable to anyone who intends to build up a successful motor delivery service.

We advocate the keeping of such records and are endeavoring to educate truck users toward this end, by our Efficiency and Economy Competition. For this contest we are supplying all those who have entered their vehicles, bound record books and daily report blanks for the drivers, which greatly facilitate the keeping of these costs.

THE STANDARD MOTOR CAR COMPANY, local agents for the Kelly truck, report the sale of a three-and-a-half-ton truck to Vestal & Hubbard, feed merchants, of Petaluma. The big truck performed a feat that proved it would be a great saving in hauling poultry foods to outlying customers. The truck, with a load of three and a half tons of feed besides the driver, and others, made a trip in one hour, which required seven hours for a four-horse team to make.

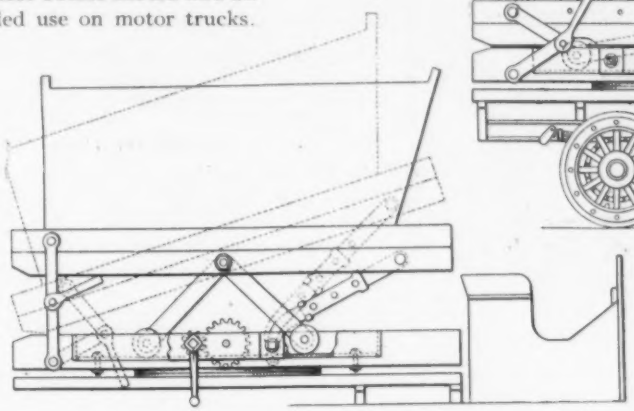
LOGANSPORT, IND., has appropriated five thousand dollars to purchase an auto patrol. Bids have been advertised for.

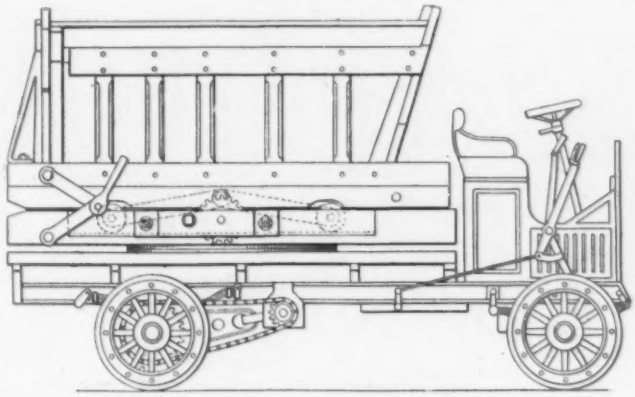
The Dumping Body as Applied to Commercial Motor Cars

BY E. S. FOLJAMBE

BODIES on commercial vehicles have gradually been made to conform to modern high-speed requirements.

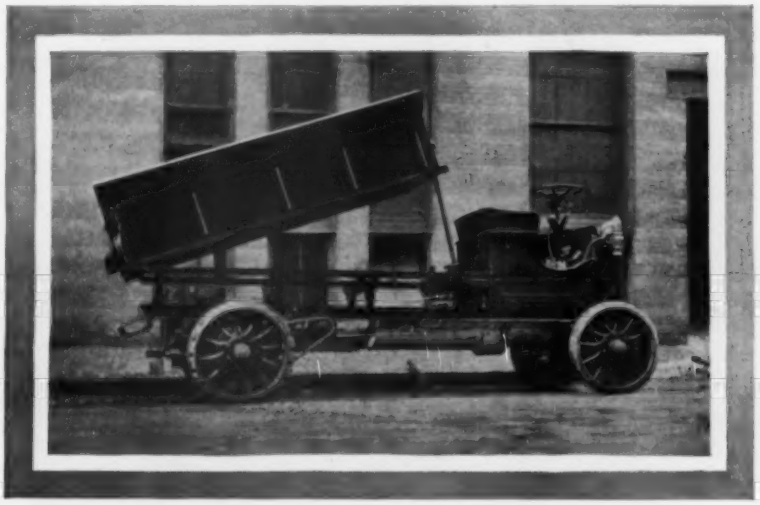
The old-fashioned coal wagon is now very seldom seen on our streets, having been almost entirely displaced by more up-to-date constructions, such as the elevating coal-body from which the coal is emptied through a chute at the rear end. Dumping bodies designed for being rapidly emptied are now the order of the day, and it is but a natural step that these bodies should find an extended use on motor trucks.





A Lally Design of a Rotating Dumping Body which can be elevated and turned in any direction desired and then dumped. These are in use for coal, sand, garbage, etc.

Up to the time of their introduction on power-driven vehicles, all these bodies were elevated, tipped or dumped by hand. More or less labor is required, especially where five to seven tons are raised several feet in the air in order to get a proper inclination on the chute. Some of the more progressive makes have already connected this mechanism with the power plant of the truck, so that all that is now required to dump such a body can be done with a simple movement of a lever, the driver remaining in his seat. The engine is not stopped, but upon arriving at the place where the load is to be delivered, it is but a matter of seconds and suitable gearing to shift the body into the proper position and deposit the load in the required spot. The mechanism which is required, if using the power of the engine to operate the body, is but very little more than that used when the load is dumped by hand, therefore, additional mechanism or complication of mechanism cannot be very strongly advanced as a disadvantage. Naturally with any added gear, chains or sprockets, there will be an opportunity for derangement and breakage, but the dumping mechanism is usually of a very simple and substantial nature, which does not easily get out of order. It is also sometimes argued that such a truck with power delivery saves only three or four minutes over the time required to do the same work by hand and, therefore, it is not worth while to connect up with the engine. It is often suggested that the driver will stop to light his pipe or do something else when he gets to the point of destination instead of dumping the load, and thus the few minutes which might be saved will be wasted. This, however, is no argument, because it applies just as much, and more, to a hand-dump wagon as to one in which the motor does the work of lifting the body up.

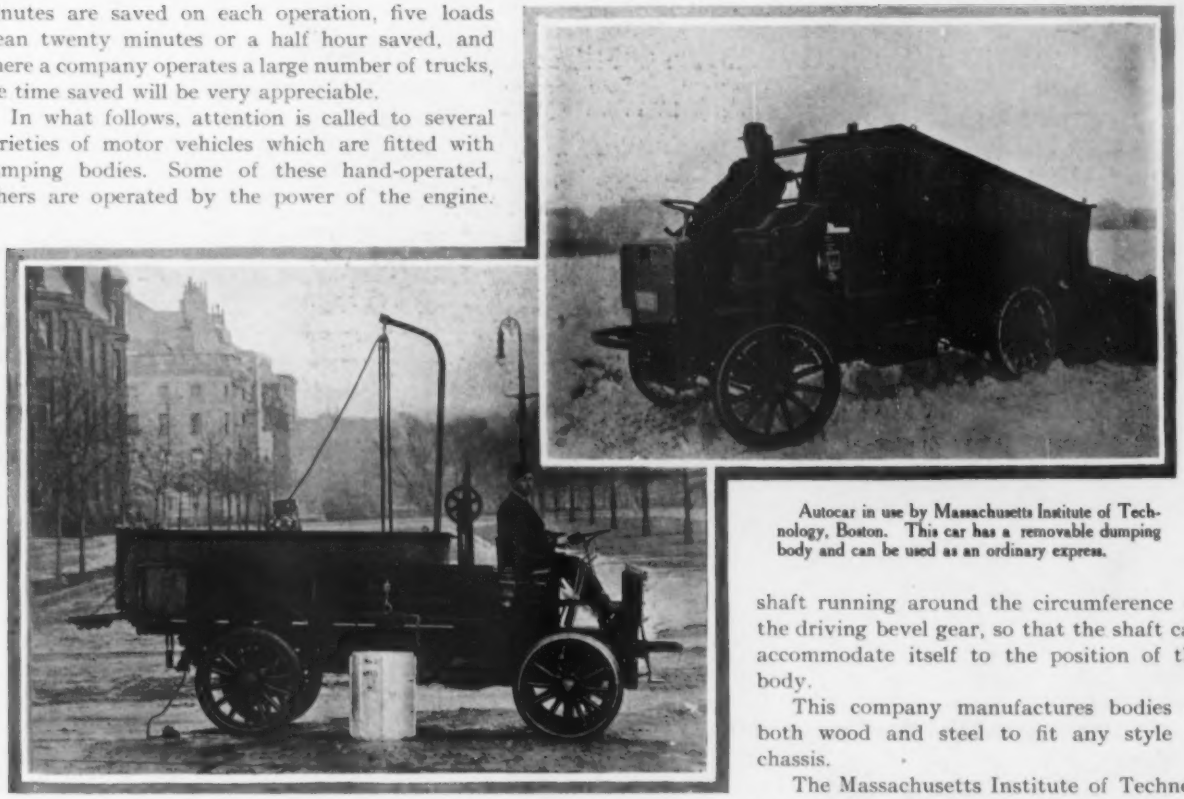


Another Lally Dumping Body, operated by motor and power by means of a screw bevel gear driven from the engine shaft. This screw can tilt backward while being driven, its upper end passing through a trunnioned nut.

For most purposes, especially where heavy loads are carried, the mechanism of the bodies of the future will be motor-driven, and there is undoubtedly a large field of usefulness for such bodies. It seems almost foolish for a man to laboriously and slowly elevate six or seven tons to a height of five feet when the motor is standing idle. The engine can be made to do this work at very little expense, and in a fraction of the time. Even if only four

minutes are saved on each operation, five loads mean twenty minutes or a half hour saved, and where a company operates a large number of trucks, the time saved will be very appreciable.

In what follows, attention is called to several varieties of motor vehicles which are fitted with dumping bodies. Some of these hand-operated, others are operated by the power of the engine.



Autocar in use by Massachusetts Institute of Technology, Boston. This car has a removable dumping body and can be used as an ordinary express.

In the accompanying illustration is shown a dumping body by Patrick Lally & Sons, of South Boston, Mass. This body is raised by the power of the engine. In one form of body the pivot point is at the rear of the chassis and the front end is raised by an arm on each side, operated by a link, the lower end of which is pivoted to a block which acts as a large nut on a long horizontal screw running lengthwise of the chassis at each side. These screws are turned by bevel gears from a short transverse shaft driven by the engine shaft. As the blocks travel along the screws, the linkage lifts the front end of the body. These bodies are arranged to be dumped either by hand or power.

The line drawings show another body by the same company. This body cannot only be elevated, but is fitted with a turntable so that it can be swung around and dumped in any direction desired; a feature which will commend it at once to many users. It is elevated by a special screw, from the side, by hand. It can be tilted to any angle and is excellent for coal or sand. The mechanism is such that it can be used on bodies up to six-ton capacity. Where a vertical screw shaft is used, this shaft is so arranged that it tilts backward as the body is elevated, at the same time it is being driven. This is accomplished by a set of miter gears, the one on the shaft running around the circumference of the driving bevel gear, so that the shaft can accommodate itself to the position of the body.

Aries Seven-Ton Dumping Body, showing position of body when discharging load. The action of the body is entirely controlled by lever, the motor supplying the power.

This company manufactures bodies of both wood and steel to fit any style of chassis.

The Massachusetts Institute of Technology, Boston, Mass., uses an Auto car for carrying ashes and other rubbish to the dump. The iron box or ash body was made at the institute out of No. 11 gage iron, by their own men, and weighs about five hundred pounds, the actual cost of the homemade body being only seventy-eight dollars. This body is entirely separate, and when the truck is run into the garage a pair of small tackles hung from the ceiling hoist the body so that the truck can then be used in the ordinary way.

Just back of the driver's seat and fastened to the permanent body is a small hoisting apparatus which enables the driver to raise the front end about three feet, sufficient to discharge the rubbish and ashes. This car, it is said, saves much time and handles the ashes of five thousand tons of coal in addition to other rubbish.

The time required for this work, even during the cold season, is only about half a day, the other half of each day the truck does the regular expressing about the city and between the buildings of the college.

Seven-Ton Truck on Steel Tires

A foreign truck, manufactured by the Aries Automobile Company, Paris, France, and known as the Aries Motor Truck, is now being imported by J. Jaccard & Company, 1956 Broadway, New York. These machines have many unusual features,

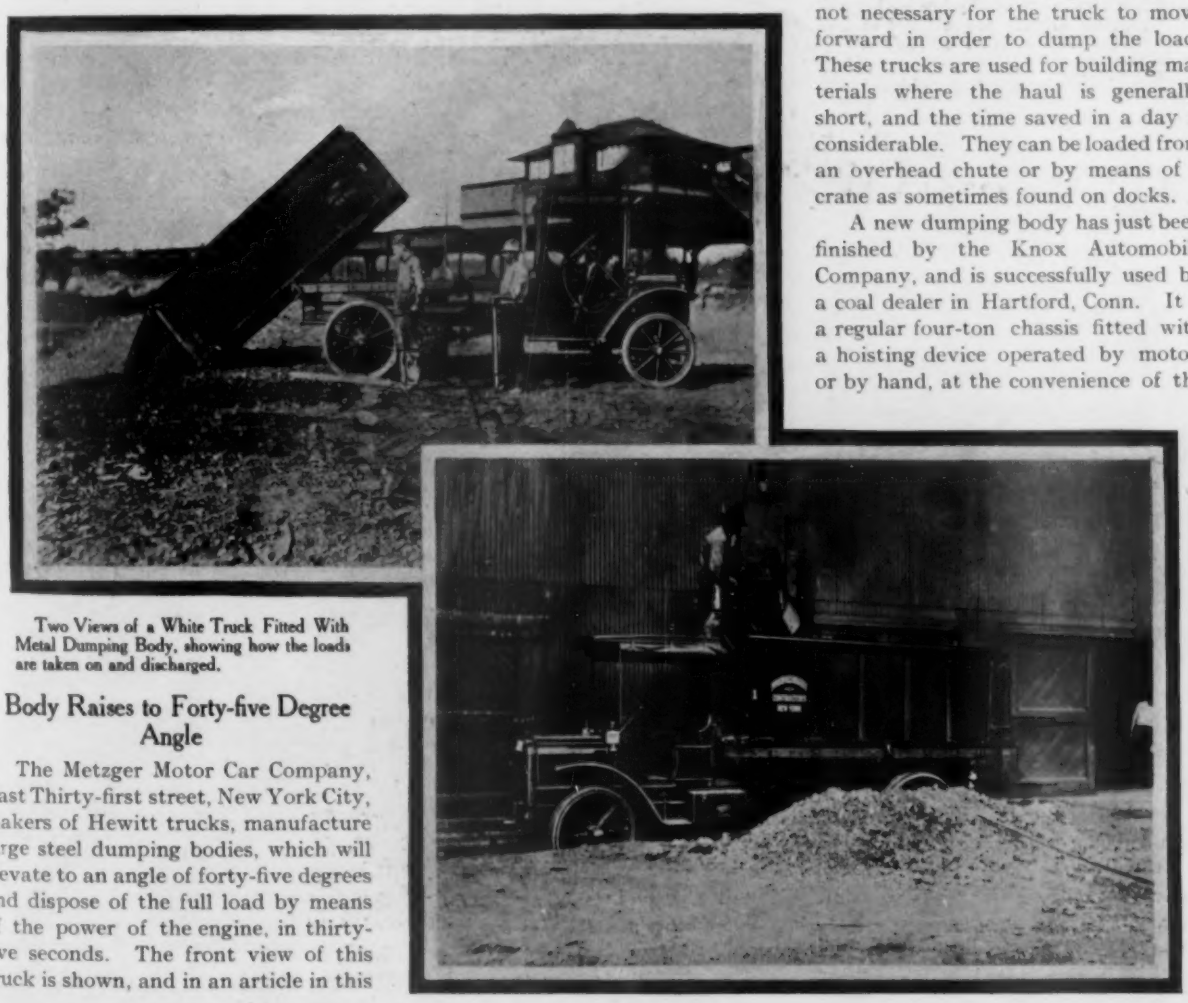
one of which is that of using nothing but steel tires. The trucks are fitted with a special dumping body operated by the motor and have a capacity of seven tons. A small hand lever at the right engages a gear on the driving shaft, and operates a worm gear at the front of the body, which in turn rotates a worm shaft lifting the front of the body and holding it at any desired height. This machine is shown in the accompanying photographs, being loaded with coal from overhead chutes and also discharging a load of cinders. The tail gate shifts automatically.

Aries Dumping-Body Truck Taking on Coal. This machine is operated on solid steel tires front and rear

In the photograph is shown a White truck equipped with a dumping body and is in use by McDonald & Berry, New York City. Its principal work is in hauling cinders, gravel, etc. One of these pictures shows how the truck can be quickly loaded from above and in the other it is seen discharging a load of cinders by tilting the body.

same issue, by Mr. Johnson, this same truck is shown discharging a load. The mechanism consists simply of a friction wheel, which engages the periphery of the flywheel by means of a hand lever. This in turn rotates a worm screw, winding up chains on a drum. These chains are connected to arms projecting downward from the front of the body and pass up over pulleys before winding around the lower drum. The particular car shown in the photograph has been in use for over a year by the Goodwin Sand and Gravel Company, of New York, in hauling sand, gravel and asphalt for building operations and for making roads. It is claimed this is the first dumping body in use in New York which would successfully dispose of a load of warm asphalt, as it will not slide until an angle of forty-five degrees is reached. This type is much less destructive to the chassis than those in which the body is run backward and allowed to tilt by gravity, hitting the ground with more or less jar. It is also not necessary for the truck to move forward in order to dump the load. These trucks are used for building materials where the haul is generally short, and the time saved in a day is considerable. They can be loaded from an overhead chute or by means of a crane as sometimes found on docks.

A new dumping body has just been finished by the Knox Automobile Company, and is successfully used by a coal dealer in Hartford, Conn. It is a regular four-ton chassis fitted with a hoisting device operated by motor, or by hand, at the convenience of the



Two Views of a White Truck Fitted With Metal Dumping Body, showing how the loads are taken on and discharged.

Body Raises to Forty-five Degree Angle

The Metzger Motor Car Company, East Thirty-first street, New York City, makers of Hewitt trucks, manufacture large steel dumping bodies, which will elevate to an angle of forty-five degrees and dispose of the full load by means of the power of the engine, in thirty-five seconds. The front view of this truck is shown, and in an article in this

driver, so that the load may be gradually dumped in a coal chute by the slow elevation of the front end of the body. A platform body can be made by removing the side and rear panels, making two trucks in one.

These trucks can be furnished in any capacity from two to seven tons.

The Fisher Motor Car Company, of Philadelphia, Pa., are also manufacturing sheet metal bodies for use on motor trucks. These bodies are pivoted at the rear of the chassis and are shallower toward the front. They are power-dumped by means of a hand lever within easy reach of the driver without leaving his seat. This lever engages a bevel gear and a vertical shaft by means of a friction clutch. This gear is in mesh with a gear on the engine shaft, and at the upper end of the vertical shaft is a worm operating a worm wheel which rotates a drum, upon which the chains lifting the forward end of the body are wound. The rear gate on this body also opens automatically as the body is raised, the load being discharged in twenty-two seconds. After the body reaches the desired angle a side trip automatically disengages the clutch, making this appliance what is termed "fool proof." In lowering the body, the lever is shifted to the other extreme which reverses the power. The same kind of an automatic trip is used for the throw-out, bringing the clutch to a neutral point. These bodies are made in capacities up to seven tons; one is shown in the accompanying photograph in the act of discharging a load of coal through a sidewalk coal hole.

The Fisher Motor Car Company's Dumping Body, motor-operated, delivering a few tons of coal in Philadelphia

The following data on a six-ton truck based in coal hauling demonstration is given showing various cost items:

Cost of Maintenance per Day (Ten Hours).

Fourteen Gallons Gasoline	$1.54
Lubricating Oil	.45
Repairs	.35
Depreciation	2.25
Interest on Investment at Six Per Cent.	1.00
Driver	2.75
Storage	.75
	$9.09

Three-quarters hour round trip hauling seventy-eight tons.

Cost of maintaining and operating three teams with carrying capacity of four tons each required to do the same work:

Feed	$6.00
Shoeing	1.40
Stable Rent	2.60
Depreciation	.75
Driver's Wages	6.75
Interest on Investment	.62
Veterinary and Pasturing	.17
	$18.29

In hauling sand the truck actually did the work of seven teams, which to the layman may seem incredible. This, however, was possible owing to long-distance hauls.

In the accompanying photograph is shown a Model O five-ton American truck of the American Trucking Com-

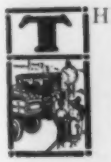
Front View of Hewitt Sand and Gravel Truck. This truck will dump a load of soft asphalt in 35 seconds as it tilts to 45°. It is claimed to be the first in New York City to accomplish this work.

Six-Ton American Truck used by the Syracuse University, Syracuse, N. Y., for hauling all the coal used

pany, Lockport, N. Y. It is equipped with a self-dumping coal body. This installation is owned and operated by the Syracuse University, Syracuse, N. Y. The body is hopper shaped and discharges by gravity. It is made to hold five tons on the water level, and will hold six tons rounded up. It will discharge the six tons of buckwheat coal from one side in six minutes, and from both sides at once in one-half the time. Larger coal, which is drier, is much more rapidly discharged, requiring but three minutes. They are hauling from forty-five to fifty tons per day with this truck, on which they depend entirely for their supply, and since its installation early last season, it has hauled all the coal to the University, whereas, before that, three teams were constantly employed.

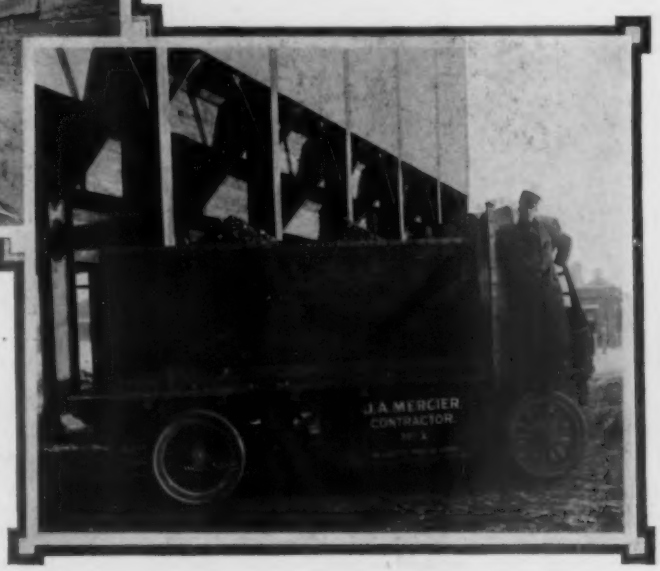
Minimum of Load Handling Essential if Satisfactory Service is Desired

BY WILLIAM J. JOHNSON



THE uninitiated user of commercial cars has many things to learn, more especially if he has heavy deliveries to make. He will learn that the commercial car, properly used, is the best method to be had for his work, and he will also ascertain that it is not a paying proposition to have a single package pass through the hands of everybody in his establishment before it finally reaches the purchaser. Obviously, that means too much expense for the delivery of a single purchase. He will also learn that the drivers of his vehicles can accomplish much more if the loads are properly routed and so defined that there will be no necessity for retracing or covering the ground twice to deliver a single purchase. A lot of time can be wasted in delivery, and a great deal more in loading the vehicles.

Fig. 1. A Slow Method of Coal Delivery. A ton of hard coal costs $7.75 and the purchaser must pay twenty-five cents additional for having it delivered



Figs. 2 and 3. An Up-to-date Five-Ton Electric Truck With Hopper Body. The same vehicle with the body lifted from the chassis ready to be delivered to the fire room.

Unnecessary Handling

From a close observance of many users it would appear that loads are handled much more than need be. This is true of horse service, especially of coal, to which this article is mainly devoted. Economy of service demands that a trip be made in the shortest time possible and with the least possible consumption of fuel, by the shortest and quickest route and without delays.

Taxing the Coal Consumer

Of the various commodities that are handled unnecessarily, coal is pre-eminent. It is a safe assumption that for every operation the consumer must pay the freight. There appear to be various methods of coal delivery governed more or less by the section of the country, and the temperament of the dealer. In horse service especially, some of

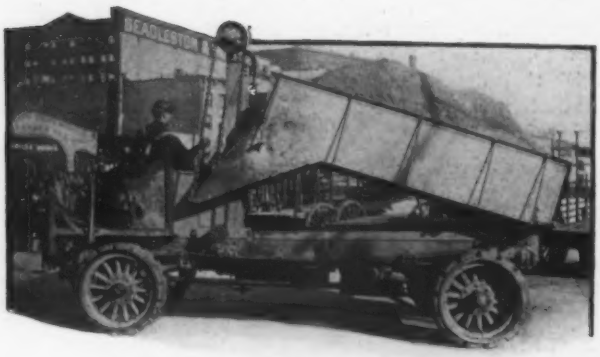


Fig. 4. An Automatic Dumping Body, seven tons capacity. Driver dumps the body by throwing in a small hand lever

the modes of handling are such as to provoke mirth, and hardly to be expected in this generation. The main purpose in this sketch is to set forth the difference between horse and commercial-car service. In Fig. 1 there is shown a horse-drawn vehicle driven into a back yard. It will be noted that the driver is shoveling the load from the wagon to a wheelbarrow which, when filled, is trundled to the cellar window. This is rather a slow method and the joke of it is, that under such conditions the consumer pays for that delivery. For example, through the Middle West, where nearly everyone burns soft coal, anthracite coal sells at $7.75 a ton and you must pay tribute to the man who sells you the coal to the tune of twenty-five cents additional; in other words, the dealer gets twenty-five cents for delivering the coal. Just imagine what a howl would greet a big dry goods merchant if he were to charge for delivery of purchases. But in many cities, not only in the Central West, but in the East, this sort of thing exists although few people are aware of the fact.

Fig. 6. Same Car After Delivery of Coal; has taken on a load of ashes to be carted away

Some More Slow Methods

There are other slow methods of horse delivery. Of course it must be considered that the location of a house at which coal is to be delivered is a factor, but in nine cases out of ten where these slow methods prevail, up-to-date commercial cars could be used to advantage. It is hardly likely that coal dealers still using horses would accept this statement, but judged by actual service conditions it holds true. The quickest accepted horse method of coal delivery where elevating bodies are not used, is to place the coal in bags at the yard. This permits of a larger load being carried than if the coal is in bulk. This scheme prevails throughout the East. In the Central West a wagon may be loaded at the yard with three grades of fuel, coke, soft and hard coal. The driver of the wagon carries with him a steel wheelbarrow and a few planks, possibly also a few canvas

Fig. 5. Another Self-Dumping Body, three tons of coal unloaded in the turn of a hand

bags. Upon arriving at the scene of load discharge, the coal is shoveled into the road, then shoveled back into a wheelbarrow and trundled along the planks to the cellar window. Or, the coal may be shoveled into bags, a slow operation that could have been performed in half the time at the yards, then carried to the cellar. This all makes for unnecessary handling of load as compared with the up-to-date, commercial-car methods.

Commercial Car Means Less Handling

Progressive coal dealers realize that the commercial car is a vehicle of utility well adapted to their needs when equipped with any of the many quick-loading special bodies now furnished by various makers. The motor truck will haul a greater load, travel at a faster pace and do more than twice the work of horses, therefore is well worth consideration by those conservatives who still use horses and apply an additional charge for delivery, which is wholly unwarranted.

Whole Body Removed With Load

An interesting type of quick unloading commercial car, used in coal service, is shown in Figs. 2 and 3. The vehicle here is a five-ton electric General Vehicle and one of a pair used in transporting coal from the yards to the central plant of the illuminating company. In Fig. 2 is shown the car just loaded at the coal pockets; in Fig. 3 the entire body has been lifted from the truck and about to be delivered to

the coal room at the heating plant. The body is simply a large steel hopper which rests on the vehicle chassis, from which it is raised and removed. The whole thing is done in a very short time, in fact there is no unnecessary operation connected with the unloading, so that the actual loading and unloading is at a minimum. It will also be noted from Fig. 3 that the car takes up less room than the horse equipment shown in the foreground.

Quick-Dumping Body

Fig. 4 shows a quick-dumping body, mechanically operated, fitted to a Hewitt seven-ton truck. This class of body is especially useful when coal is to be delivered through

Fig. 7. Another Good Example of the Modern Method of Coal Delivery. This vehicle will transport a greater load than a horse outfit and do it in less time, and according to the owners, has already effected a big saving in cost of coal delivery.

manholes and the like, where, ordinarily, the method is to deliver own a chute. Obviously, the vehicle here can be relieved of the entire load in a short space of time. The operator has simply to place the truck in position and by means of a hand lever the body is raised by the motor, the actual work being done through a two-foot wheel with two-inch face engaging the flywheel and connected with a worm gear operated 50 to 1. The body herein shown is of seven tons capacity and ca be used for coal or sand.

Figs. 5 and 6 show a Mack three-ton truck fitted with a dumping type of body. It is plain to be seen that there is a minimum of loading operations here. In Fig. 5 it will be noted that the load has just been dumped through the manhole in the walk to the fire room. This is not a laborious task for the driver by any means. In Fig. 6 is shown the same vehicle with the body back in position and loaded with ashes to be carted away. In this service the car serves two distinct ends on one round trip, delivers coal on one leg, carries away ashes on the other. As compared with horse service the installation here is vastly more simple and effective. A horse-wagon body would have to be tilted to such an angle that the contents would slide down the chute to the fire room. In fact this angle would have to be as pronounced as that shown in Fig. 5. Furthermore, it would require longer, as the body would have to be hand-raised. In this one respect alone, commercial cars are more efficient; progressive coal dealers have found it out in actual service with abundant opportunity for comparison. Metropolitan tests of commercial cars for coal use are sufficient proof of their worth.

In Fig. 7 is shown another quick-unloading type of commercial car. It follows that the load of coal carried in a body of this sort is easily and quickly discharged. In Fig. 8 is still another commercial car with a quick type unloading body, this being used about New York City.

The mere fact that a commercial coal truck will carry a greater load and do it in less time, stamps it as a money and time saver, which facts no progressive coal dealer can afford to overlook. The coal merchant with a fleet of capable trucks has a big advantage over those who use horses entirely. For long hauls especially, the commercial car for transportation of coal is unsurpassed. As pointed out in the first issue of THE COMMERCIAL CAR JOURNAL, motor coal trucks effect a big saving and can be used ten, twelve or twenty-four hours a day and continue to do so if properly cared for.

Progress is just as essential in the handling of coal as with another commodity. With horse equipment it very generally follows that the load is shifted more often than need be, at least more often than would be necessary with motor trucks. The work now being done by these vehicles is sufficient evidence of their worth, and the coal merchant who would deliver his coal quickly, cleanly and satisfactorily with a minimum of handling, can find no better method. It is worthy of note that those dealers now using motor trucks are so well pleased with the service that they wonder how they previously did without them.

Special bodies which will greatly facilitate the handling of coal by commercial cars are rapidly being developed; most of these, however, are fitted with a rear dump only, while a few have both rear and side chutes. One maker is working along the lines of a pivoted body, which can discharge its load in any direction, but most of these are in large sizes. A small two-ton body which can discharge its load in any direction would be of great service in the delivery of coal to private residences and would prevent attempting to back and fill in narrow driveways and also save the lawns to say nothing of the time of the truck and operator, all of which means money.

Fig. 8. A Metropolitan Example of Coal Delivery. The load is here discharged from the side of the vehicle. Traffic is not blocked while the load is being discharged.

Taxicab Service Organization and Maintenance

BY D. R. HOBART

PART II.

IN the preceding part of this article it was shown that the large majority of accidents to taxicabs were due to outside sources; and to cope with these in the most economical manner it is necessary to have a "breakdown" or emergency service, made up of several units depending upon the size of the "stable," the frequency of accidents, the volume of traffic and other things.

The Touring Car

Each unit consists of a cab chassis fitted with special body, in charge of at least one skilled mechanic and one or two helpers, one of whom drives the vehicle. The chassis or "towing car" should be fitted with a body having wood sides about two feet high, with boxes at the rear end, slung under the frame, out of the way, for the tools most frequently needed, if the car be used for actually carrying a disabled cab to the garage, as is done by some of the London and Berlin companies, or made as part of the body in other cases. There should be a single seat for the driver and mechanic in the usual place, but the footboard space should be given over to carriers for spare wheels to replace those broken by accident. Axles and other parts for replacement are carried in the body of the car. For towing, two chains attached to the rear cross member of the frame and covered with leather to prevent injury to the towed cab, are preferable to the rope ordinarily used. The two chains attached to both emergency wagon and cab axle at equal distances prevent any side movement, and being covered will not rot out, or break under sudden strain, like rope.

Inaugurating the New Service of Locomotive Motor Cabs for the Hotels of Philadelphia With an Excursion Run and Dinner. The string of cabs is shown on South Broad street.

The Emergency Gang

As previously stated, this gang consists of the skilled mechanic and one or more helpers. The mechanic is the foreman of the gang and in all cases his chief duty is with the emergency wagon. Where the number of cabs is small, he will work in the shop or garage, dropping such work when notified, for breakdown service and proceeding with the wagon and gang (or as many as are needed) to the disabled cab. Where a large number of cabs are in service, there will probably be several such gangs, each with its foreman, all of the personnel being drawn from the shop, among those mechanics or helpers who have a good knowledge of the cab chassis. As with the foreman in the small stable of cabs, the helpers will work at their machines until called for service on the wagon, and in consideration of this service are usually paid slightly higher wages than the ordinary shop man in the employ of the company.

Breakdown Equipment Suggestions

For a well-organized service, the shed or room for the emergency wagon should be convenient to the gate, so that a quick start, without interference, can be made from the garage. This room should have an annex under lock and key in which are kept emergency parts such as axles, wheels, gears, brake parts, etc., in the ratio of two of each part to every three emergency wagons used. The annex is usually under charge of the foreman.

Training of the men composing the breakdown gang when in the shop is essential, as well as an arrangement of their stations so that they will be readily summoned for wagon service. It is obvious that they should be employed together in the shop and should answer to some special signal or call from the foreman. In one of the taxicab companies in New York, the gang foreman is the assistant foreman of the shop and has his gang together in the repair department, so that a hail will bring them out at once, when all proceed to the wagon. Usually but one helper, who drives, accompanies the mechanic-foreman, or another assistant may take the place of the latter where the repair is a comparatively simple matter.

Larger firms often employ "cruisers," or breakdown wagons which are driven continuously from stand to stand during the working day in order to quickly fix or tow to the garage any disabled cab at the stands or on the streets. These cruisers, as a rule, carry but one man, and occasionally are employed also for training drivers. In the latter case, their service is extremely valuable, inasmuch as the prospective driver travels the ordinary territory covered by the cabs and can observe the usual troubles encountered

and the methods used in overcoming and repairing them, while at the same time getting the driving training.

Classification of Emergencies

Emergencies are classified according as they can be repaired (1) on the road by the kit furnished on the cab itself; (2) on the road by the emergency wagon; and (3) only by return to the garage. To the first class belong the tire troubles, remedied by the use of the spare wheel or demountable rim, and the very minor engine circulation and brake troubles. Those requiring the wagon, but repairable on the road or street, depend in great measure on the skill of the breakdown gang, but actually should include the replacement of wheels and axles and, if the construction permits, of the great majority of brake and circulation repairs. The most serious of all, engine, gearbox and shaft breakdowns, destruction or damage to the frame and body and any disablement of the taximeter, necessitate the return to the garage. The organization should provide for this or a similar classification, so that the wagons should not be sent out unnecessarily. Drivers should be told just what troubles must be cared for by themselves and cautioned against calling out the wagon unless the conditions require it.

A Typical "Taxi" as Used in New York City

Training of Drivers

The limited space at the writer's disposal prevents any but the barest outline on this important subject. First, the prospective driver should be required to familiarize himself with the parts of the chassis, body and taximeter; second, to practice with the gear, brake and control levers while the car is still and the engine not running, then in starting the engine and actual road-driving under the guidance of an instructor, over streets fairly free from traffic. The last step in the training will be in the actual service on crowded street and as a regular driver, the instructor going with him somewhat in the same manner as when breaking-in a new conductor or motorman on a street railway car. When proficiency is shown, the driver should be allowed to go on service as a regular driver on a regular stand or route.

To the lack of training of the drivers is due many of the accidents by collision with foot passengers and other road users, and quite frequently with lamp-posts and the like. Insufficient training causes in the driver a lack of that confidence in himself and his cab which comes only with familiarity with all parts of the vehicle and what may be termed automaticity in action. No municipality would permit, nor would any sane transportation company dream of putting on a green motorman for a rush-hour run before he knew his levers, signals, etc., and that, too, when the vehicle runs over a regular track. How much more important is it then for an equally rigid training for the driver of a vehicle which can be driven over any part of the street and which involves steering in addition to the other duties of control.

Payment of Drivers

Salary or commission, which? This is a question which is most important regarding the remuneration of the drivers of a taxicab company. Apparently no other plans have been tried to any extent. The salary scheme for the driver gives a fixed sum per diem, usually $2 to $2.50, and finds his oil, gasoline, cab, etc.; in other words, the driver is a regular employee on the books of the company, and the expenditures for salaries are known to the dollar at any time. The commission scheme gives the driver a percentage, usually twenty-five per cent., on his takings and he finds his oil and gasoline out of his own pocket. There are a number of "mixed" schemes, such as salary with the driver finding his oil and fuel and getting a percentage of the takings; and renting, where the driver hires the cab by the day and makes what he can, finding all requisites for himself. This is considered a retrogression for any but the smallest companies, and is taken from the vicious system still in force among horse-cab concerns.

The Salary vs. the Commission System

The advantages of the salary system lie in the benefit to both driver and company, inasmuch as the former knows exactly what is coming to him per week, while the latter knows the exact cost of running as compared with the income, and can oversee the condition of its cabs and drivers, regulating the time of each in service, so as to leave sufficient time per day for inspection and prevent overworking, disastrous to both cabs and drivers. The disadvantages usually stated are prompted by commercial greed and arise from a desire to "show returns" with little or no knowledge of what is involved. Thus, with the salary system, the company is obliged to pay out a certain sum per week, which, on the commission system, would not be due until a specified time, and being invested the sum would draw a certain amount of interest, not an inconsiderable item where much money is involved. The desire to show returns favors this system of commissions, as the cash balance between payment periods is necessarily large, and the income and expenditures can be made thus to show what is really, in most respects, a false comparison.

Evils of the Commission System

Many of the drivers of the taxicab companies in the larger cities of the United States, however, prefer to work on the commission basis, claiming that the salary system limits their earning capacity. This is no doubt true; but the cab company, on the other hand, may suffer (and frequently does) from a too energetic use of the cabs at the hands of drivers who are looking out for more commission. If there is a prospect that several dollars more can be earned by driving continuously for from fourteen to eighteen hours per day, not one, but as many drivers as can do so will drive

the full period, and the cabs will suffer. In order to cut down expenses, too little oil will be used; and to gain extra money, breaches of the city ordinances as to soliciting fares will be made. In cash returns the company benefits; in expenditures for repairs, suits for damages, fines, etc., it loses. The chief evil of the commission system, similar to that of the piecework system in factories, is the dispute arising concerning the amount due the drivers, with the dissatisfaction and feeling that they are being imposed upon, and the culminating "strike" for better commissions, salary and commission, or straight salary. One large company went to the wall after losing a huge sum of money due to a strike arising from commissions partially paid and from forcing the drivers to purchase of them gasoline and lubricating oil at above market prices.

A contention sometimes made, especially where a small number of cabs are employed, is that on salary a lazy driver draws his salary but brings in no adequate return. But this contention shows lack of business system; with proper checks to the expenditures and receipts per cab or driver, such individuals are easily detected and can be discharged. Regarding "doctoring" the taximeter, this is the more likely when the driver is on salary, but where a checker is employed such a scheme is readily seen through and punished. Obviously, a driver would not doctor his instrument when working on a commission basis, but would drive to the garage for another cab or meter.

GRANITE TAXICAB CO. ——

DRIVER'S CARD

CAB NO.____ STAND____ DATE ____

DRIVER ____ OUT ____

BADGE NO.____ IN ____

CALL NO.	TIME	TAKEN UP	DESTINATION	MILEAGE	AMOUNT COLLECTED	REMARKS
1						
2						
3						
4						
5						
16						
17						
18						
19						
	TOTALS ____					

TRIPS ¼ MILES HOW RECORDING EXTRAS

METER READING OUT ____

METER READING IN ____

STARTER ____

Typical Driver's Card, showing spaces for recording calls, time, where passenger was taken up, his destination, the mileage, amount collected, remarks, and the meter readings when leaving and arriving at the stand (*in* and *out* in this card).

The "Profit-Sharing" System

To the writer, the most equitable system for both driver and company is the "profit-sharing" one, where in addition to his salary each driver receives a percentage of the profits or of his takings during a certain period. This has the advantages of the straight-salary system and tends to eliminate the lazy man, while the profit consideration in addition tends to make the drivers take a personal interest in the welfare of the company and its plant and stable while increasing their income regularly. Unions of labor, on the other hand, rather discourage such systems, claiming that they tend to nullify the purposes for which such unions are formed, in most cases.

A Typical Day's Procedure

The driver reports to his foreman at say 7.45 a.m., goes to his locker and dons his uniform, then goes to the yard, where he signs the "yard book," giving his name, badge number and the number of the cab he usually drives. After signing he goes to the cabs in their bay or yard, gets his cab, examining it for water, oil and fuel, winds the taximeter and drives to the checker at the gate. Here the checker registers his badge number, cab number and meter reading and the time on the check sheet. The driver O K's this with his initials and drives to his stand, reporting to the starter. On asignment to a call or hire he records it on his "driver's card," writing the place the fare was taken up, his destination, the time, mileage and meter reading before starting out at the beginning of the day. At nine o'clock p.m. he reports to the starter and returns to the garage, filling out his driver's card with the final reading of the taximeter. On entering the gate, he checks in, and drives the cab to the wash stand, where he leaves it. After figuring up the day's receipts, he arranges his money, O K's his card and turns the whole in to the cashier at his window.

The cab is immediately taken charge of by the garage men, the lamp men removing the lamps for filling and cleaning, and the cab is then washed, wiped, and the windows cleaned. The grease cups and tanks are filled and the cab is finally inspected by the foreman and then sent to the cab yard or bay. Thus everything is in order for the next day's service and the driver after his day's work can rest himself without the prospect of further work at a time when he is usually quite tired. Should there develop any fault during the filling, etc., when most troubles come to light, by the way, the cab can be sent to the shop and one of the spare cabs put in its place.

The Spare Driver

In the event of sickness or resignation of one of the regular drivers, his place will be filled by the spare driver, or one whose cab is laid up due to decline of patronage or other reason. Spare drivers are drawn from the men under training, those having passed through the final stage being taken on regularly when vacancies occur.

Cards Employed

The cut shows a typical driver's card, such as would be used in any well-regulated cab organization. In addition to the spaces for the items mentioned above, there will be noticed spaces for the starter's O K and for the clerk to figure out the receipts and to sign the card. When this card is turned in with the money it goes to the cashier, whose clerk fills out the statistic sheet. This latter consists of statements of taximeter readings, number of calls made,

There is an apparent discrepancy at this point.

The pages are either missing or the pagination is incorrect.

The filming is recorded as the book is found in the collections.

Shipper Must Consider Freight Congestion

The merchandise shipper is confronted by the problem of freight congestion. He ships goods hopeful that they will reach their destination on a promised date, but, usually they are late. Delays are costly and do not appeal to those awaiting the consignment. Under the present system of railroads there is bound to be freight congestion.

Multiplicity of Handling Means Delay

One feature of shipment by rail is the multiplicity of operations involved. First of all the vehicle is loaded, then driven to the freight station, where, after meeting certain formalities, the shipment is unloaded; then in due course, if there are cars at hand, the load is shifted to the freight cars. It will require at least two men to handle the freight from the base to the freight station. If the store, factory or business house is a half mile, or two miles from the railroad, the situation is much the same. It requires just so much work to get the load there, distance notwithstanding. When the goods are finally consigned to freight cars they may be in transit for a week, whereas the distance to be traversed could easily be done in 24 hours. On a busy railroad there is bound to be freight congestion, and that spells annoyance and dissatisfaction. When the shipment has finally reached its destination the same operations as at the start must be performed over again. The car is unloaded, the shipment scattered about the freight house, finally collected, loaded and delivered.

Fig. 3. A Fitting Illustration of Long Haul Capability. Four-ton truck made seventy-mile run and transported four tons of furniture that transfer company would not handle with horses. Round trip consumed seven hours.

Freight Station Time Loss

Valuable time is lost at freight centers because of the bulk of business the common carriers must handle. New York is a fitting illustration of this. Take the water front, for example, note the shipping congestion. How much time must a teamster or truck driver actually waste there before his load is received by the shipping company? A New York owner and user of motor trucks makes the statement that his drivers are tied up at the docks and freight stations seven-eighths of the time.

Commercial Car the Salvation

The commercial car is the salvation of the individual shipper who has merchandise to deliver, 25, 50 or more miles from home. He can be independent of the railroads, if he cares to be. To the conservative, common sensed, wise users of motor trucks, it will matter little if there be freight congestion; they have the remedy at hand. A thoroughly reliable three or five-ton truck, or, heavier or lighter vehicles in proportion can do the work satisfactorily. The time is not far distant when 100 mile deliveries by motor trucks from large business centers, for instance as New York, Boston, Chicago and San Francisco, will be common.

Is the Commercial Car a Cheaper Method?

Some will quite reasonably inquire if the commercial car is the cheaper method. The writer in the course of interviews with makers and users of cars has received affirmative and negative replies to that same question. One maker states that if there is a haul to be made at either end from the freight station, then, the commercial car is the cheaper method, but if it is not a a case of haul at either end, the railroad is the cheaper method. This is a broader question than would at first appear, as witness the following citation. A furniture mover who does a big business and traverses the country broadcast with a fleet of commercial cars states that all things considered, shipping of household effects, furniture and the like, is cheaper with commercial cars, for the reason that such must be packed. That doubles up the cost. Rail shipment means packing or crating the furniture to comply with the rules of the road, one operation; loading on the van, two operations; delivery to freight station, three operations; loading in cars, four operations; then successively, shipment, unloading from cars, loading to furniture van, delivery to house, removing to house and uncrating, making in all nine operations at least.

The Contrast

As a contrast, shipment from one town to another by motor truck is a much simpler proposition. It merely means removal from the house to the van, delivery to the destination and there unloading. On this basis furniture can be delivered 25 miles cheaper than would be the case by rail, which means two hauls at least. With the commercial car there is but one haul.

With ordinary merchandise, boxed or cased, the proposition is more simple for the reason that loading requires less time.

The manager of a middle western dairy operating a farm 22 miles from the city depot states that for long hauls their two and three-ton trucks are "worth their weight in gold." It simply means loading at either end and with fairly good roads to traverse, the trucks make the trip very nicely. The

runs are usually so arranged that there will be a load to carry each way so that two distinct ends are attained.

Another user of a three-ton truck has frequently made over 100 miles in one day with a full load.

Not a Question of Capability

With a standard vehicle it is not a question of capability, but the knowledge on the part of the owner that his trucks can be utilized for long hauls, rather than the railroads. That long hauls are possible is being demonstrated every day in the week. The time is past when one must coddle or favor a truck for fear it will balk. Present day construction is such as to insure satisfactory long distance service. It is but reasonable to state that if a truck can do 50 to 75 miles a day in city service it can accomplish as much over good suburban roads.

Shown herewith loaded with household effects is a four ton Sampson truck. This vehicle made a run from Detroit to Ypsilanti and return, in all about 70 miles, in seven hours, an average of ten miles an hour. The owner of the goods had changed his residence and wanted, in a hurry, his belongings which were in Detroit. The transfer company would not consider the proposition with horse equipment and there was not the time to bother with rail shipment, as that would have meant a couple of days anyway. The load is estimated at close to four tons, and was recently transported when the roads between Detroit and Ypsilanti were not in as good condition as at present. When the owner found that the transfer company could not care for him he stated his case to an officer of the company building the Sampson trucks, who volunteered to assist him with the result as noted above. This was actual service. The goods were transported, a load that would have proved a hard one for horses. The distance being so great, would have required relays and a much longer time.

Influence of Improved Roads

Now that commercial cars are becoming more generally used the subject of good roads will be pursued with even greater interest than ever before. Assume that there is a faultless highway between New York and Boston as was proposed not so very long ago, what a vast amount of good work a fleet of commercial cars could accomplish under such conditions. Improvement in the more remote districts will open up new fields of enterprise, and those sections now devoid of railway communication will be benefited. To a degree, the motor truck can accomplish in this respect that which has been attained by the railroads.

That railroad officials have given the matter some thought is evident from the case of a brewer doing a large volume of business outside his own town and throughout the New England states. With the idea of bettering his system of transportation especially as regards cities within a radius of 50 to 75 miles from his establishment, he consulted with a maker of commercial cars. The freight agent of the road over which he shipped his goods knew this, and in order to retain his trade, made an offer, the terms of which would ordinarily be considered prohibitive by the road. The offer was such that acceptance was but sound business policy for the shipper. This shows that the railroad realized what could be done by commercial motor cars.

Shippers Should Consider the Subject

Merchandise shippers who patronize the railroads will do well to consider what can be accomplished with motor trucks on hauls up to 100 miles. There are numerous examples of successful long distance service. The delays that must be encountered at either end of the line in railroad freight shipments are eliminated in motor truck use. Surely the freight train proceeds at a faster pace, but so much time is lost at either end that on a run of 100 miles it would appear that the commercial car is absolutely unsurpassed. To say the least, it is solving the problem for many and is doing a work heretofore deemed impossible.

Direct Delivery

The one thing to keep in mind is that there is but the single haul. There is direct delivery from the shipper to the consumer in motor truck service. With the railroad there is a haul at each end of the line, nine times out of ten. Even where concerns have spur tracks, the time taken to shunt cars and load them would be sufficient for a commercial vehicle to travel over the road to its destination. Regarded from any angle, there is so much to commend the use of motor trucks that the up-to-the-minute thinking business man or concern cannot afford to long ignore the utility of the commercial car for long distance work. Such service means increased revenue and the delays incident to rail shipment avoided by commercial cars would more than make the venture well worth while. Where a fleet of vehicles is employed for long distance work the problem is somewhat simplified. A standard truck may be relied upon to travel 100 miles in a day without undue labor. To say the least the matter cannot be regarded any too seriously.

(To be Continued.)

A Simple and Effective System of Keeping Track of Commercial Cars

BY WILLIAM J. JOHNSON

SUCCESS in any line of business depends largely on how that business is conducted; in other words, there must be an effective system; there must be accurate knowledge of just what service costs. It is hardly to be expected that inexperienced users of motor trucks would know a great deal about system. Horse and commercial car services have little in common, and the methods applicable to one mode will not work with the other. This is best proven by the experiences of those who have entirely abandoned horse service and have had a time of it in trying to persuade the "barn boss" to change his tactics and forsake antiquated and useless stable methods

Manufacturers make it a point to charge off d preciation on productive equipment each year; they have some definite system of doing things. They have a reason for charging off depreciation each year. Some users of horses do things in a businesslike manner and charge off depreciation once a year. This is usually rated at such a very high fiure that there is a liberal margin of safety.

System Imperative

Too much emphasis cannot be placed on the fact that system is imperative; there must be definite, absolute knowledge of what service is costing and whether or not car, tires, batteries and kindred equipment are approximating the standard of efficiency adopted.

Many users have been in the habit of regarding commercial cars simply as a good advertisement; something that would lend the firm a little more prestige. A purchaser of a three-ton standard truck took this view of the matter and at the time of purchase charged off one thousand dollars to advertising, contending that the vehicle was an advertisement. In this particular service, however, there is a system. It is known just what delivery is costing and for many reasons it is higher than it should be. The system here is a comprehensive card index. It is known to a penny what the service costs.

ELECTRIC AUTOMOBILE RECORD

LICENSE NO.	FACTORY NO.	TYPE
CAPACITY	MAKE	PRICE
DATE RECEIVED	DEPARTMENT	
USED FOR		
ODOMETER MAKE	TYPE	NO.
TYPE OF TIRES	SIZE OF FRONT TIRES	REAR
REMARKS		

Fig. 1. General Record Card, 5 x 8 inches. All necessary general information can be recorded here

It has been the experience of the writer that those concerns whose business is transacted with mechanical equipment keep the most accurate records of costs and the like.

As a rule, electric light companies are well fixed in the matter of accurate data. Illuminating companies throughout the country are doing a good work in the furtherance of commercial car interests. These concerns generally know just what to expect in the way of service and, since they make and market current, it is quite natural that the electric vehicle is the one selected for their use. The president of a progressive Eastern electric light company expressed the opinion that his concern could not make money if once in five years it did not renew its equipment.

A Good Example of System

The aim of this sketch is to assist the users of commercial cars who have no system of keeping track of their cars and the work they are doing. As above cited, electric lighting

BATTERY SERVICE RECORD

No. of Battery	Date Rec'd	Make	Type	No. of Cells	No. of Trays

Amp. No.	RATE		ODOMETER		Miles	REMARKS
	In	Out	In	Out		

Fig. 2. Battery Service Record Card, for use in keeping track of electric commercial cars

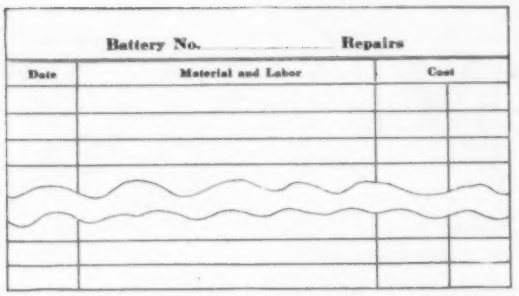
companies usually have a good system of record of car work, and that used by the Edison Illuminating Company, of Detroit, Mich., will serve as a good example. This, while devoted to electric cars, can, with modifications, be made to answer all practical purposes for gasoline equipment. This concern knows "the whole story" about its cars, mileage, total cost of repairs, and the like.

The Edison record is kept on three 5 x 8 in. white cards and on a summary sheet bound in a loose-leaf book, the size of this latter being 8⅜ x 15½ in.

In Fig. 1 is shown the 5 x 8 in. card, styled "Electric Automobile Record," these three words forming the heading for the card. On the first line of the card is entered the license number of the car, the factory number, and type. On the second line there is space for the capacity, make and price of the car in service. In ordering new parts the necessary information regarding the make and model of the vehicle is known at a glance. This saves time in the purchasing department. On the following line is recorded the date the car was received and the department to which it was assigned. On the next line the use for which the car is employed is noted. The odometer, make, type and number are recorded, and more complete information as to details, which renders matters simple when ordering repairs and the like. The next line is given up to tires, the type first being recorded, the size of the front and rear members, a blank line following for additional data on this subject. The next line, as well as the ten following, are set aside for the "Remarks and miscellaneous" classification.

Battery Service Record

In Fig. 2 is shown another 5 x 8 in. card, headed "Battery Service Record." It is good practice to keep a separate record of batteries in electric vehicles. The tires, too, could, if the individual or concern deemed essential, be

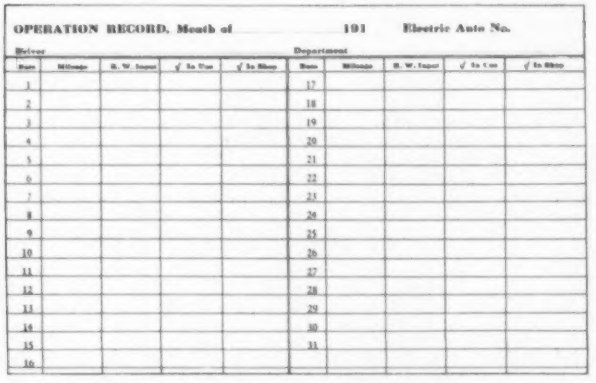

Battery No. ..... Repairs

Date	Material and Labor	Cost	

Fig. 3. Reverse Side of Fig. 2 arranged for recording costs of battery repairs

kept separate instead of incorporated with the general record. In this particular case, however, large cards are employed so there is no crowding of the data. On the first line of the battery record card is to be recorded the number, make, type, number of cells and number of trays of the battery. The date on which the battery is received is to be entered on the line below.

There are three general classifications on this particular record card, as date, odometer and remarks. The first of the seven spaces, or columns, is for the entry of the vehicle number, the second under the date subdivision is for entry of the time the battery was installed, the next when it was


OPERATION RECORD, Month of ..... 191 Electric Auto No.

Driver ..... Department .....

Date	Mileage	K. W. Input	✓ In Use	✓ In Shop	Date	Mileage	K. W. Input	✓ In Use	✓ In Shop
1					17				
2					18				
3					19				
4					20				
5					21				
6					22				
7					23				
8					24				
9					25				
10					26				
11					27				
12					28				
13					29				
14					30				
15					31				
16									

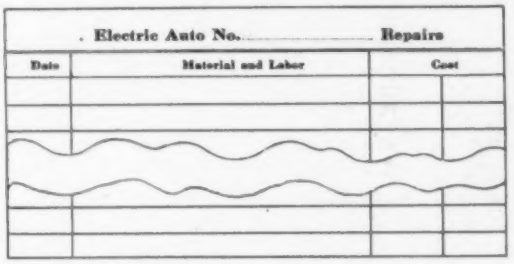
Fig. 4. Monthly Operation Record Card, which can be modified for use in keeping track of gasoline cars

removed. The odometer classification is disposed in like manner. The next column is for the mileage record and the last is devoted to remarks.

In Fig. 3 is shown the reverse side of Fig. 2, the heading being "Battery No.—— Repairs." Then arranged or spaced, are the date, material and labor and the cost in the last two columns. All information regarding the batteries is thus recorded by using both sides of the card.

In Fig. 4 is had the "Operation Record," this being kept by the days of the month. The number of the vehicle is recorded in the upper right-hand corner, while just below is space for the name of the driver and the department in which he and the car are assigned. Fig. 4 is equally spaced, there being five columns, the days of the month following in rotation from 1 to 31, the second column in each division being mileage, the next k.w. input, the following in use, then, in the shop, making a complete record.

Fig. 5 is the reverse side of Fig. 4 the card being headed "Electric Auto No.—— Repairs." This is also spaced for


. Electric Auto No. ..... Repairs

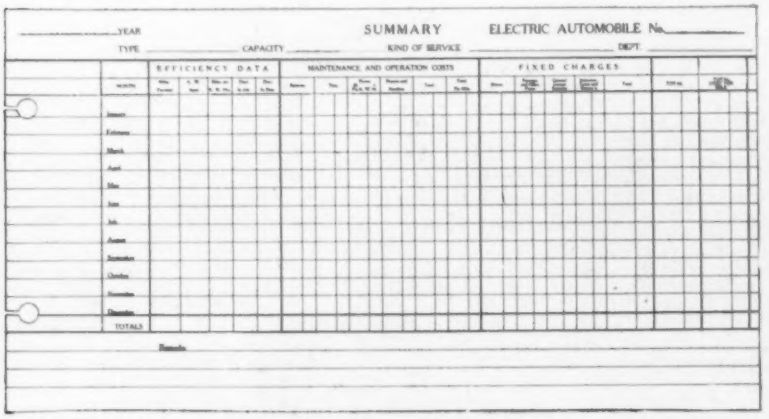
Date	Material and Labor	Cost	

Fig. 5. Reverse Side of Fig. 4, arranged for recording general repair costs

the date, material and labor and the cost. Here again does the concern know down to a penny just what goes into a vehicle and just what it costs for operation.

Summary

In addition to the three cards, two of which are ruled for record on each side, there is also kept the "Summary," shown in Fig. 6. On the second line are entered the type, capacity, kind of service and department. There are three general classifications on this summary sheet, "Efficiency Data," "Maintenance and Operation Costs" and "Fixed Charges," so that when entries have been duly made each month, the necessary information may be had at a glance. The first column is arranged for the months of the year from January to December. Then, under the "Efficiency Data" heading come, each arranged in columns, the miles traveled, k.w. input, the miles per k.w. hour, the days in use, and the days in the shop, showing the actual use the car gets.


..... YEAR SUMMARY ELECTRIC AUTOMOBILE No. .....

TYPE ..... CAPACITY ..... KIND OF SERVICE ..... DEPT. .....

	EFFICIENCY DATA					MAINTENANCE AND OPERATION COSTS						FIXED CHARGES							
MONTH																			
January																			
February																			
March																			
April																			
May																			
June																			
July																			
August																			
September																			
October																			
November																			
December																			
TOTALS																			

Remarks .....

Fig. 5. Yearly Summary Sheet, which can be modified to suit individual cases. This contains all general information needed, discerned at a glance

Under the "Maintenance" and "Operation Costs" classifications the battery costs come first, then tires, next the power, at so much per kilowatt hour is charged up, then follow in order, repairs and sundries, total and total per mile. Under the heading of fixed charges comes first the wages of the driver, then the foreman and office force, general garage expense, insurance, taxes and depreciation, total, then grand total and the grand total cost per mile.

At the bottom of the sheet are four lines set aside for "Remarks." From this summary, the yearly cost of a given car is known at a glance and, if more detailed information is desired, there is resource to the car record card, the monthly operation card, and the like.

Speedwell Commercial Cars

BY WILLIAM J. JOHNSON

ANOTHER American manufacturer of pleasure cars has lately engaged in the production of commercial cars, introducing as the initial effort three vehicles, one light and two heavy, double-side-chain-driven models. The firm referred to is the Speedwell Motor Car Company, of Dayton, Ohio.

The Speedwell commercial cars, the makers assert, are presented with the assurance that they combine in like degree all the features to be desired in a motor truck that have marked the successful four-cylinder Speedwell pleasure models.

It is quite to be expected that there would be certain things about Speedwell construction which, while not necessarily deviations from the accepted methods of to-day, would be different. That is simply Speedwell individuality, which is reflected in all three models, the construction of which is, in the main, identical, with slight modifications here and there as would be dicated by the needs of each especial class. The Model Y is rated at two tons load capacity, the Model Z at four tons, while the largest car is of five tons rating, the smaller selling for $2950, equipped with a stake body, the Model Z at $3500 or more, according to the body fitted, while the five-ton vehicle is to be had for $4000, fitted with a standard body.

Speedwell Commercial Cars are fitted with four-cylinder water-cooled engines, L type, these housed under the driver's seat, which may be tilted when it is desired to reach the unit, a cone-type clutch, three-speed sliding-gear transmission, double side-chain drive, all three vehicles being chain-driven. As previously mentioned, the construction is about the same in all three cars. A feature of the four and five-ton models is a power winch operated from the transmission countershaft.

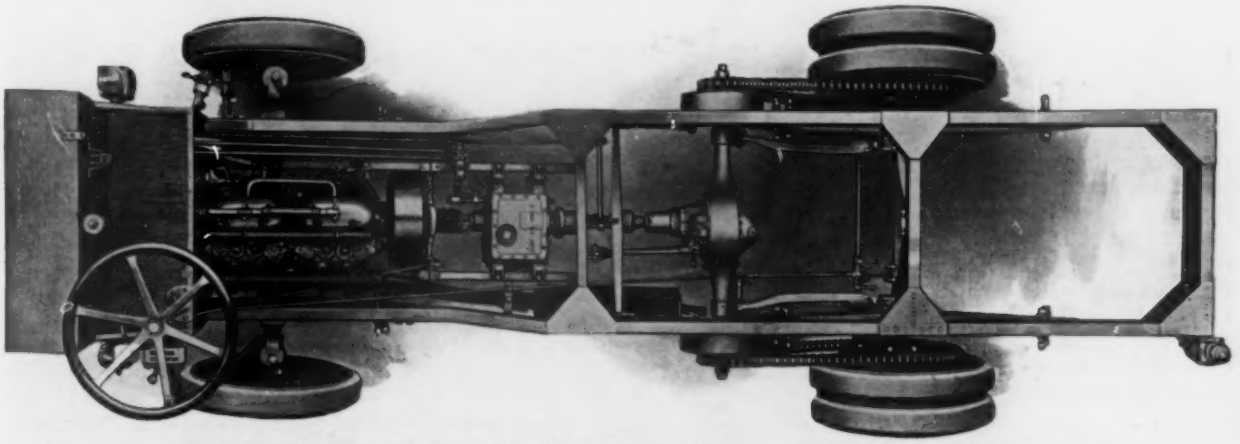
The wheel base in the larger cars is 115 in., in the smaller vehicle 110 in.—comparatively short, it will be noted, but purposely so, since operation in close quarters is thus possible.

The left side control, which has come to be quite favorably regarded, prevails on the Speedwells. The Model Z is designed to be operated at a maximum speed of 12 m.p.h. and the Model Y at 16 m.p.h.

Accessible Motor

A notable feature of the Speedwells is the accessible power plant, the motor, supported at four points to the subframe being under the driver's seat, at the base of which are metal doors or covers which may be raised, or the whole seat may be tilted either way, so that the engine is getatable in every sense of the term. The cone clutch is likewise easily reached.

In both Speedwell models a four-cylinder, vertical, water-cooled engine is used, the Model Z equipment, rated at 50



Chassis of the Four-Cylinder Four-Ton Speedwell Commercial Car. Note the construction of the frame, which is inswept to provide for short turning radius; note also the heavy frame gussets

h.p., being 5 x 5 in., the Model Y 4¼ x 4½ in., rated at 30 h.p. The cylinders are cast in pairs with integral water jackets, and, since the engine is of the L type, the valves are placed in overhanging pockets on the left side of unit, worked through a single solid alloy-steel cam shaft 1¼ in. in diameter, shaft bearings plain. The inlet and exhaust valves are 1⅞ in. in diameter, interchangeable, and action is through vertical lifter or push rods carried in cast-iron guides retained in the motor base; the lift or point of contact with cams, is mushroom type. The valve springs are round section steel wire held in cup-shaped washers, and there is the usual provision for adjustment of the lifters.

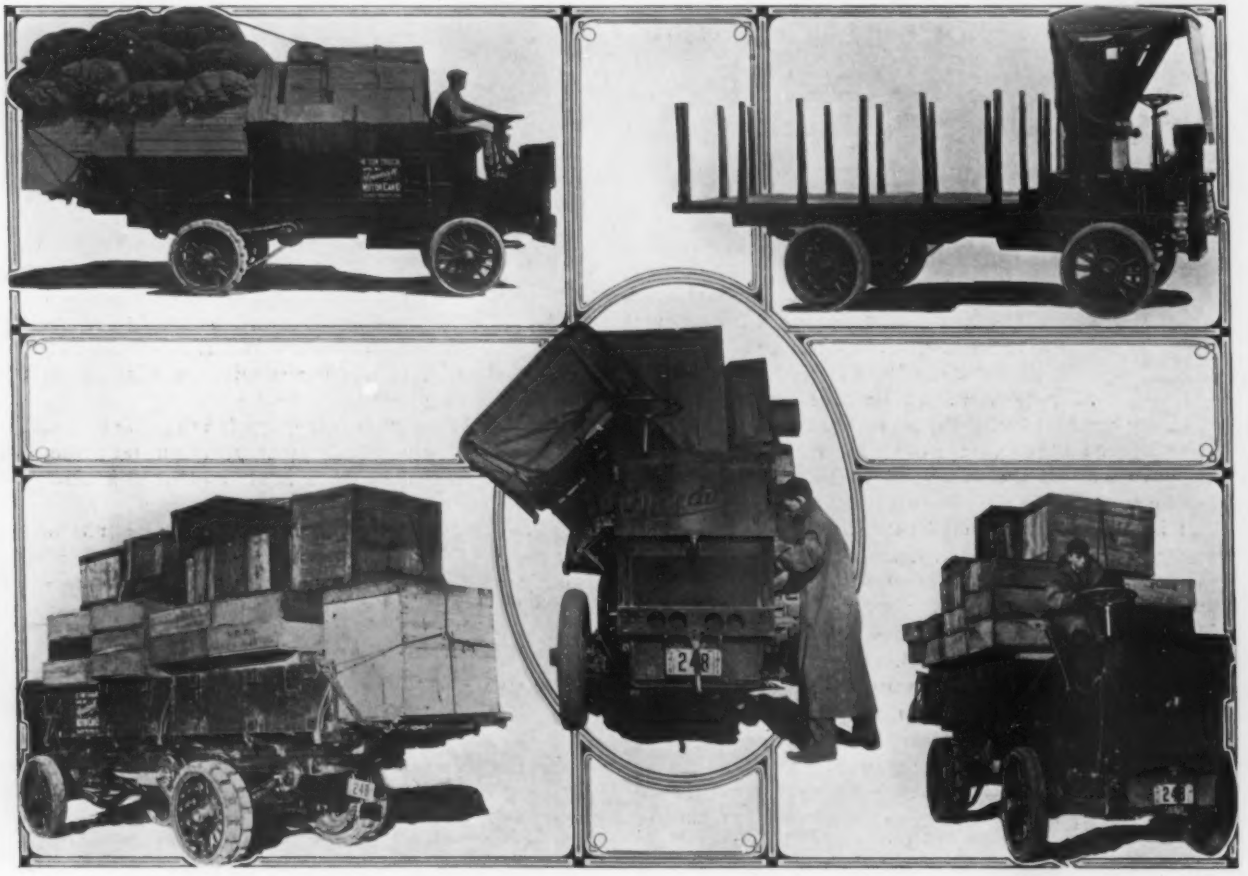
The pistons, like the cylinders, are cast of close-grained gray iron, and the process of manufacture is such as to make for perfect compression. These flat-topped members are fitted with four compression rings placed above the hardened and ground wrist pins

The connecting rods are drop forged I-beam section steel fitted with plain bearings on the crank pin ends, the upper ends being retained tight to the piston pins which bear in the piston bosses.

The crank shaft, a three-bearing member, is of alloy steel 1⅞ in. in diameter and is machined from end to end, and ground on the bearing surfaces. The plain bearings are retained in the upper section of the crank case through ½ in. steel studs and nuts. The forward bearing is 3 in. long, the center 3½ in., and the rear member 4½ in. long. The flywheel, which is 17¼ x 5 in., is bolted to the integral web or flange of the crank shaft with six ½ in. bolts.

Cone Clutch

The Speedwell clutch is of the flywheel cone type, the male member aluminum, 15¾ in. in diameter, face of 2½ in., facing leather. Tension is through the usual square section coil steel spring with end thrust cared for by a ball thrust bearing. A feature of this flywheel cone clutch is that the rotation of the member is checked on declutching, this being accomplished through a fiber disc retained to a spring-steel strip, the tension of which may be altered through a steel set screw fitted with a lock nut. This disc is 1⅜ in. in diameter and 7-16 in. thick, so that in operation, and assuming that the engine is well under way the momentum of the clutch being checked, there is no shock on the transmission gears; an important consideration in commercial car usage. The clutch shifter is anchored to a steel tube, which in turn bears in brackets on the subframe. The connection between the clutch and the transmission is a universal joint, carried in a leather boot, so that it is protected from the elements.



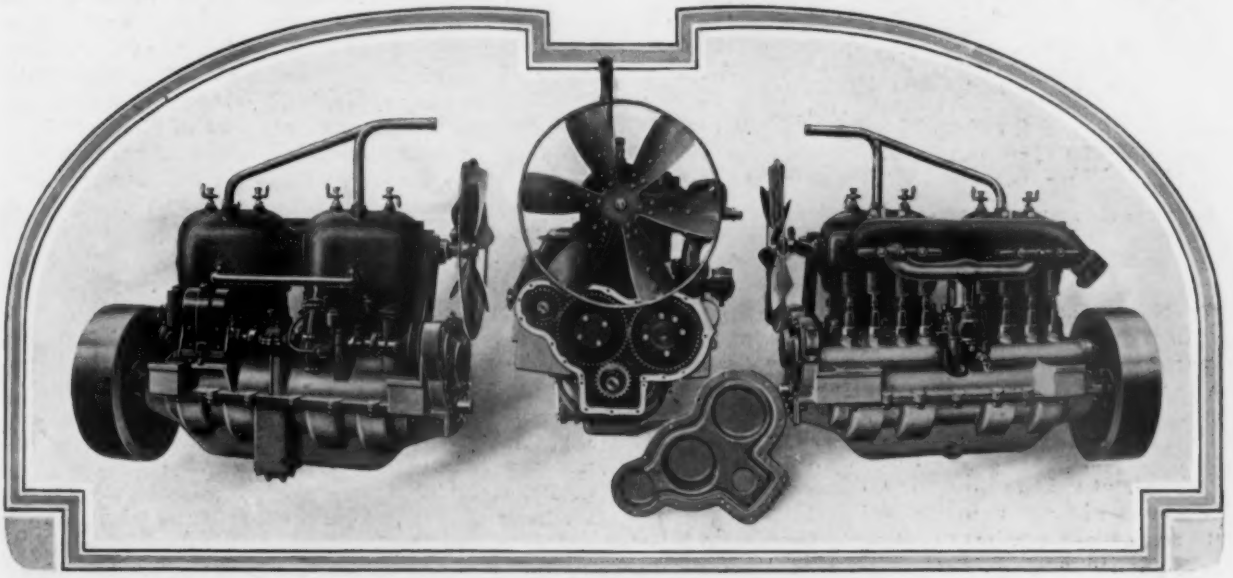
Group of Speedwell Commercial Cars, showing different views of the four-ton model. The center picture shows the seat tipped to one side, exposing the motor. The radiator is spring-suspended

Three-Speed Transmission

The transmission in the Speedwell Commercial Cars is of the selective sliding-gear order, three speeds ahead and reverse, shafts and gears of alloy steel, heat-treated, with

annular ball bearings. The shafts are ground, the gears of stub teeth are carefully treated to insure smooth engagement and to preclude all possibility of a noisy, destructive clash. The gear box is aluminum, and cast integral with the case are the four supporting arms. A full-sized cover plate with an oil plug is fitted, this being retained through steel bolts. Anchorage is to the sub-frame, which supports the motor and clutch. The changes in speed are made by the usual hand side lever at the left, tubular steel bars with adjustable connections being used.

The drive to the jack shaft is through a short universal-jointed propeller shaft to the differential housing, which is a pressed-steel member. The bevel pinion and shaft are formed integral and may be removed in a unit from the front of the case. The bearings are Timken roller type.



Motor Details of the Speedwell Four-Cylinder Engine, valves worked through single cam shaft on the left, water pump and magneto located on the right, support at four points to subframe

The jack shafts are squared on the inner ends where they recess in the differential, these shafts being 1½ in. in diameter, nickel steel. The differential and jack-shaft housings are formed in one section, the shaft housings tapering from the center or differential housing proper outward to the frame sides where they are supported in brackets which are hot-riveted to the frame side members.

The drop-forged front sprockets are ¾ in. in diameter and are secured to the jack shaft. The rear sprockets, cast steel, 23 in. in diameter, are formed integral with the brake drums, drive from jack shaft to rear sprockets being through roller chains, which are of 1½ in. pitch, ¾ in. wide.

A triangular tubular torsion bar extends from a cross member of the frame back to the differential housing, the forward connection being a spring buffer.

Front Axle

The Speedwell four-ton truck is equipped with an I-beam drop-forged front axle, this being formed in one solid piece with integral steering yokes and spring seats. On the smaller truck the same construction prevails, except, of course, that the member there is somewhat lighter, in keeping with the service for which the car is intended. This four-ton axle is 2½ in. across the top and bottom faces, while the large diameter of the spindle is 2¾ in. Timken roller bearings are carried at the tops of the steering spindles to support the load, the wheel bearings also being of the Timken roller variety.

Rear Axle

The rear axle of the Speedwell four-ton commercial car is 2¾ in. square at the center, this being a forged member with spindles 2¾ in. in diameter.

Cast-steel, adjustable radius rods, with adjustable brackets at the rear and attached forward in brackets on the jack shaft housing, are fitted, the rear supporting brackets, by the way, being integral with the rear spring seats.

The rear driving sprockets, formed integral with the brake drums, are clipped to each of the fourteen spokes of each rear wheel, in a substantial manner.

Wheels

The wheels are wood, artillery type, of very heavy construction, there being fourteen spokes front and rear, and the wheel bearings are Timken roller. On the larger car the front and rear wheels are 36 in. in diameter, fitted with 5 in. solid rubber tires forward and 5 in. solid dual at the rear. On the smaller vehicle the wheels are 34 in. in diameter, fitted forward with 4 in. solid rubber tires, rear with 3 in. dual—option being given of 5 in. solid single rear.

Frames

The main frames of both large and small Speedwell Commercial Cars are made of channel section rolled steel. The four-ton member is 4 ft. 8 in. long, 2 ft. 10 in. wide forward, 3 ft. 2 in. wide rear, channel 6 in. deep and 2 in. wide, stock 7-32 in. thick. The length back of the driver's seat on the standard chassis is 10 ft. 11 in. and the height from the ground to the top of the frame under a three-ton load is 3 ft.

On the smaller model the frame, rear, is 3 ft. 4 in. wide and 2 ft. 10 in. forward and the length back of the driver's seat, on the standard chassis, is 9 ft. 1 in., the height from the ground under a two-ton load being 2 ft. 8 in.

The side members of the frame in either car are inswept forward. Motor and transmission are supported on the sub-

frame, which is anchored at the rear, to a cross member, and in like manner forward, the side rails of this sub-frame being braced by brackets or plates extending from the side members of the main frame. All riveting in Speedwell frames is done hot, and not only are the frames strengthened by cross members, but also by heavy gussets riveted top and bottom to the cross members where they engage with the main frame.

Speedwell Three to Four-Ton Truck, showing accessibility of the motor by tilting the front seat. It can be tilted to either side. Engine under seat gives long loading space.

Though the side members are inswept forward, there is no sacrifice of loading space, the frame being thus constructed to simplify steering and to facilitate in operation at close quarters where short turning radius is quite to be desired. A flat cross piece, perforated, so as not to interfere with the cooler, extends from one side of the frame to the other at the forward extremity, this being riveted in place.

Springs

The front and rear springs of the Speedwell Commercial Cars are semielliptic in design, and on the four-ton model the rear springs, which are built of fourteen graded leaves, are 3 in. wide and 48 in. long. The front springs, 3 in. wide, are made of nine graded leaves, being 40 in. long. Both front and rear sets are carried under the side rails of the main frame, anchorage being to cast-steel brackets riveted to the frame side members. The front and rear hangers of the rear set and the rear hangers of the front set follow the same general design, while the forward supports for the front springs are short brackets, to which the spring ends are retained through hardened steel bolts. The links or shackles are formed of heavy steel side plates $\frac{3}{8}$ in. thick, which may easily be replaced if ever necessary, and to provide for smooth and easy action of the springs at the extremities, grease cups are fitted.

The front axle spring seats are formed solid with the axle, but at the rear these are separate members, which, as before stated, are made a part of the rear supports or brackets for the radius rods. Front and rear springs are held to the axle seats with $\frac{3}{4}$ in. nickel steel clips.

Auxiliary Spring

An auxiliary spring is featured in the Speedwell trucks, this being anchored to a cross member of the frame directly over the rear axle. Brackets are attached to the rear axle and when the car is fully loaded and this auxiliary member is brought into action, the ends of the spring bear on these brackets or plates, otherwise there is a slight clearance. In this manner the side springs support the load under ordinary conditions, also making for easier riding, the auxiliary being intended for the heavier work. This spring is clearly shown in the accompanying illustration. The member is varied in size according to the model on which it is fitted.

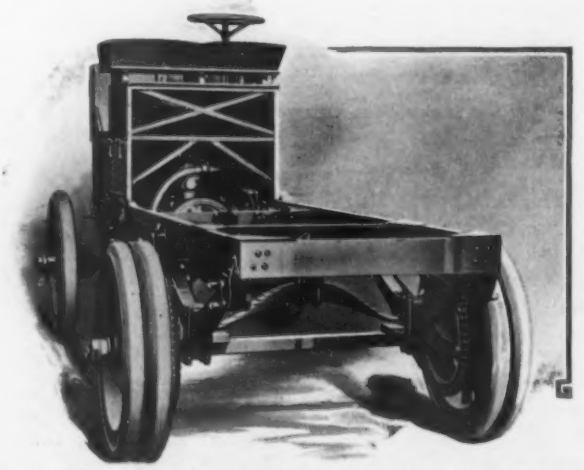
Brakes

The two-ton Speedwell differs from the four and five-ton models in brake equipment in that the larger cars have one brake more; that is, there are two brakes on the rear wheel drums, two on the jack-shaft drums, while in the smaller vehicle there are two brakes on the rear wheel drums and one brake on the transmission-shaft extension, the band being supported in a bracket riveted to the cross member of the frame just aft of the gear box. This member is 10 in. in diameter and 3 in. wide, and is of the contracting type, worked by the hand side lever. The expanding rear members are worked by a foot pedal.

On the large commercial cars, the rear-wheel members are of the internal expanding type worked by a foot lever, the drum being 20 in. in diameter, face of 5 in. The emergency set is carried on the jack shafts, the drums bolted to the sprockets being $13\frac{1}{2}$ in. in diameter, with a face of $2\frac{1}{2}$ in. The action of the rear members, that is, the expansion of the bands or shoes, is brought about through drop-forged steel wedges, which ensure a positive action. The effort is transmitted through adjustable steel pull bars, action being equalized. The rear-axle brake equalizer is a Y-shaped steel casting clipped to the left side of the axle, the final braking rods or rocker shafts being $1\frac{1}{4}$ in. in diameter, the clips, $\frac{1}{2}$ in. in diameter, giving great strength.

Steering

Left side control is favored by the designers of the Speedwell by reason of the many advantages thus obtainable. In large and small models, the worm and worm



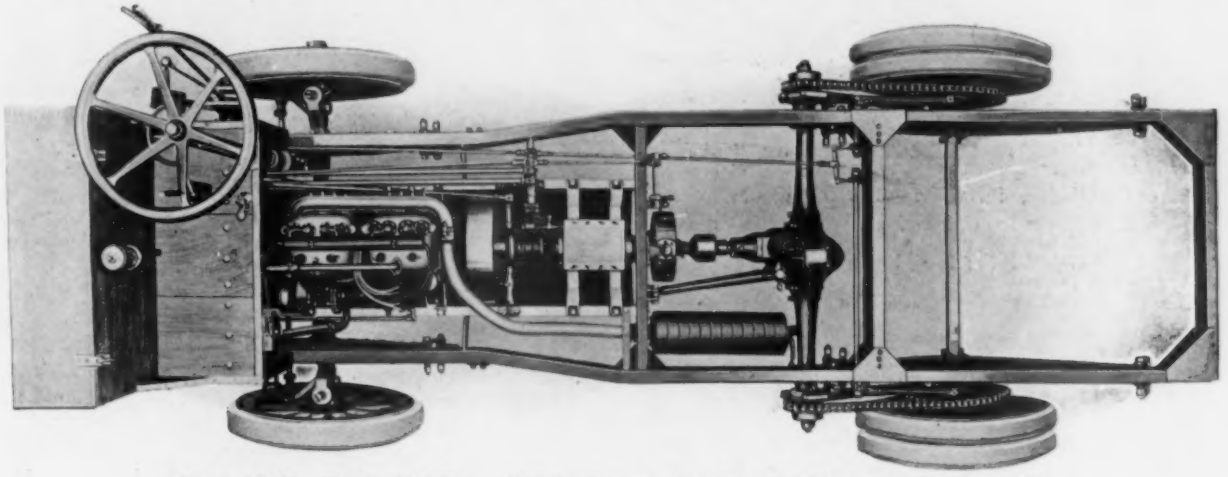
Rear-Axle Construction of the Speedwell Two-Ton Truck, which is similar to that of the four and five-ton models. Note the extra cross spring for heavy loads.

sleeve type of steering gear is employed, the wearing parts being carefully hardened, thrust taken up through thrust bearings. In the large vehicles the vertical steering post is $1\frac{3}{4}$ in. in diameter, the hand wheel being 22 in. The steering-rod assembly is $1\frac{1}{4}$ in. in diameter, carried in front of the axle, joints ball and socket type, adjustable, with grease cups at all bearing points. The tops of the steering spindles, as before mentioned, are provided with Timken roller bearings. The steering-gear case is cast steel and is bolted to the frame side member.

Lubrication

A self-contained force feed and splash system of lubrication is employed in the Speedwell motors, the crank case of aluminum being cast in two sections, parted on the center line of the bearings (which are supported in the upper half of the case so that the bottom is used for oil storage or as a reservoir).

Amidships and on the right of the bottom section of the crank case, which has cast integral with it individual compartments for each of the connecting rods, is a gear oil pump which draws the supply from the lowest point in the case. This is raised to the bottom proper of the case, since the oil well is really in the false bottom of the lower section. A constant stream is raised to the connecting rod oil wells where, overflowing, it drains back to the bottom of the case to be strained and again used. The main bearings and connecting rods are provided for by the splash set up within the case, which also cares for the timing gears forward, the pistons and cam-shaft bearings. A sight feed on the dash permits the operator of the vehicle to know just how the system is working. A gage is also placed above the gear-driven pump on the crank case. The forward motor gear compartment is rendered oiltight by an aluminum cover plate.

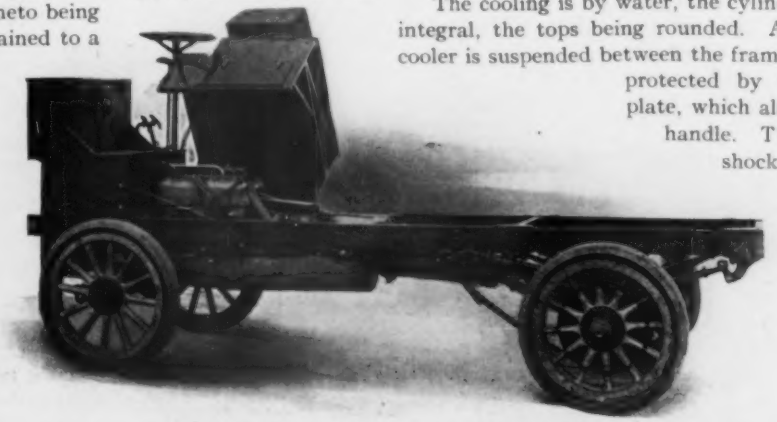


Chassis of the Two-Ton Speedwell Commercial Car. Construction is similar to that of the four-ton and five-ton models Gasoline tank is carried in compartment above the cooler

Ignition

A dual system of ignition is employed on Speedwell Commercial Cars, magneto being Bosch make, strap retained to a base cast integral with the upper crank-case section on the right side, and driven from the water-pump shaft through a short shaft and coupling. A storage battery is used for starting the car and for secondary use. The high-tension Bosch magneto is controlled from the dash switch and from the ¾ in. vertical spark lever under the steerng wheel. A self-starting Bosch coil is so placed as to be within easy reach of the operator.

The ignition cables are carried in a fiber tube supported above the heads of the cylinders, and but short lengths are employed. The spark plugs of this high-tension system are placed over the inlet valves. Compression cocks are located in the heads of the cylinders.



Speedwell Two-Ton Truck Chassis, showing how seat may be tilted back, thus making for accessibility of motor, transmission and clutch

Carburetor

A water-jacketed Model L Schebler carburetor is used on the Speedwell motors, this being located on the working side of the engine, the aluminum intake of 1¾ in. inside diameter being of conventional design and held in place on the cylinders in conjunction with the exhaust, 2½ in. inside diameter, through spreader clamps, so that to remove the manifolds is a simple matter. Hot water is led to the mixing chamber from the forward cylinder water jacket through a ¼ in. copper tube, the outlet from the mixing chamber water jacket being to the water pump. The control of the instrument is from the steering wheel.

The eighteen-gallon gasoline tank is placed in a forward compartment above the cooler, feed being by gravity, the fuel passing through a water separator carried on the side rail of the sub-frame at the left.

Cooling

The cooling is by water, the cylinder jackets being cast integral, the tops being rounded. A rectangular cellular cooler is suspended between the frame ends forward and is protected by the perforated cross plate, which also carries the starting handle. To overcome road shocks the radiator is supported on coil springs, there being a set of these at each side of the cooler. The top of the radiator comes under the floor board and a half-turn brass filler plug is placed above the water line.

The water pump, centrifugal type, is located on the right side of the engine and is driven through a shaft ¾ in. in diameter and flexible coupling, the bronze pump case being secured to the 1 in. brass water manifold, this being practically a straight member secured to the cylinder jackets through the glands and steel studs. The pump shaft is provided with a stuffing box.

The water, after having passed through the jackets, which also completely surround the valve chambers, is passed out through the heads of the cylinders through a 1¼ in. brass lead and back to the cooler. The pump supply is drawn from the base of the cooler.

A six-bladed, belt-driven, ball-bearing, aluminum fan is carried in a bracket back of the cooler, the fan idler or pulley being driven from the motor gears on the right side of the engine, belt 1 in. wide. The fan blades are rim-bound, which makes for rigidity.

Control

The control of the Speedwell Commercial Cars is in accordance with the best practice of the times. The spark and throttle are controlled from the steering wheel, and gears are shifted by the usual hand side lever. Brakes are set by the foot pedal, and the emergency side hand lever and the clutch are actuated by foot pedals. The ignition is controlled from a dash switch.

Power Winch

A feature of the four and five-ton Speedwell Commercial Cars is the power winch, which is driven from the countershaft of the transmission, the member being thrown into engagement by a small hand lever working a clutch, this lever being within convenient reach of the driver. The winch is so placed that it may be used to the best advantage, being located back of the driver's seat, therefore well forward in the body of the vehicle.

Bodies

Although the Speedwell Commercial Cars are of short wheel base, there has been no sacrifice of loading space in consequence. On the four-ton truck the loading platform is 12 ft. 6 in. long and the height of the platform above the ground loaded to three tons is 3 ft. 8 in.

On the smaller model, the length of the loading platform is 10 ft. and the height from the ground, under a two-ton load, is 3 ft. 1 in. Bodies will be fitted according to the needs of the purchaser's trade or business.

As above stated, the motor under the driver's seat is readily accessible by raising the side doors of the metal bonnet, or, the driver's seat may be tilted to either side as shown in the accompanying illustration, so that the whole motor is then exposed. Then too, a cover plate is fitted in the floor board back of the driver's seat, this being directly over the transmission, so that to reach this member is also an easy matter.

THE AUTOMOBILE PRINCIPLE APPLIED TO RAILROAD WORK

Something entirely new in the automobile industry is the Otto Gasoline Section Tool Car, illustrated herewith. This car was designed especially for the Chicago & Rock Island Railroad by the Otto Gas Engine Works, of Philadelphia, manufacturers of the Otto automobile, and has a number of interesting features.

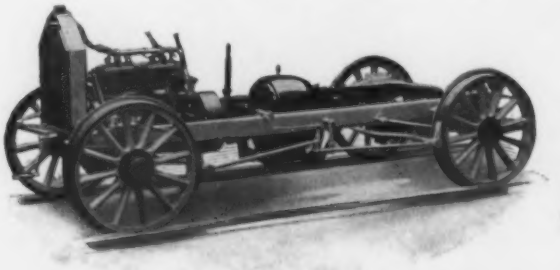
The Otto Gasoline Section Tool Car

Its purpose is to convey men and tools to any point on a railroad system, where repairs or construction work are needed, with the greatest convenience and speed, and to supply the necessary power for operating electric tools to complete the work with the maximum efficiency and in the minimum time.

The motive power for the car is supplied by a 30 h. p. four-cylinder four-cycle gasoline engine, while electric power for operating the electric tools carried is supplied by a generator, operated by the same engine which propels the car. If necessary eight to ten men can be conveniently carried, and as many tools as can be placed upon it. The tools furnished with this car include two electric spike screwing machines, six electric drills, electric saw for rails and portable emery wheels. Where occasion requires, or where it is desirable for any reason, additional cars or tenders can be readily coupled to this car for carrying spikes, extra cable or anything in the way of material, additional tools or men, as desired.

This car is operated in practically the same manner as an automobile. When the driver throws the clutch into engagement with the engine to run the car, the generator is disengaged, and similarly when the car reaches the point of operation the engine is disengaged from the transmission and engaged to the generator. A portable turn-table with extension rails is provided to remove the car to a siding when a clear track is needed.

To eliminate the necessity of constantly moving the car along the track from one small operation to another, a quantity of cable is carried which can be laid along the track as far as a quarter mile in any direction from the car.



The Stripped Chassis, showing generator mounted in center

About twenty feet apart, all along this cable, are plug-in switches, and each electric portable tool is equipped with a special stage plug. Therefore, the tool is simply carried along to any point needed for the length of this cable, and plugged in at the most convenient switch.

Federal One-Ton Motor Trucks

THE FEDERAL MOTOR COMPANY, of Detroit, Mich., presents for 1911, a clean-cut, one-ton truck chassis, which was shown for the first time at the Chicago Automobile Show. Three standard designs of bodies are carried, although any design may be furnished to order. The standard chassis is of 120 in. wheel base and is equipped with a 30 h. p. motor. The price of the chassis is $2100.

Motor

A four-cylinder engine, 4¼ x 4½ in., made by the Continental Engine Company, constitutes the power plant. The cylinders are cast in pairs and are of the dome-head style. The crank shaft is of drop-forged steel, having three bearings, the diameter of all crank-shaft bearings is 1¾ in. The piston is 5 in. long and is equipped with four compression rings, ¼ of an inch wide, three of them being above the piston ring and one below. The lubrication is by a constant-level splash system, the oil being supplied by a gear-driven oil pump, built in the motor. This maintains a fixed level of oil, into which the connecting rods dip. The surplus oil is carried in the bottom of the crank case, and is pumped to the main bearings and the crank pins. The other moving parts in the motor being supplied by the surplus oil which is thrown off the crank. The side of the crank case is provided with a gauge showing the level of the oil. The excess oil automatically flows back in to the reservoir.

The cams are forged integral with the cam shaft, thus eliminating any possibility of the cams getting loose. The cam shaft has three bearings, 1¾ in. in diameter, by 2¼ in. in length. It is driven by helical gears, steel against iron, lubricated by splash from the front crank. This arrangement insures silent running and long life. The cylinders are water-cooled, water circulation being effected by means of a centrifugal gear-driven pump. The radiator is hung on coil springs, mounted in such a way as to take both upward and downward motion of the car. It is of sufficient efficiency to allow the motor to run idle all day without heating up, were it desired to do so, the water capacity being five gallons. The flywheel weighs eighty pounds and is 18½ in. in diameter by 3½ in. wide. All engine bearings are die-cast from Parson's white brass.

Fig. 1. Federal One-Ton Truck

Ignition and Carburetion

A Bosch single system is used to ignite the vapor, using a Bosch high-tension magneto, with fixed spark. This does away with the disadvantage of it being necessary for the operator to thoroughly understand the manipulation of the spark. It may be said in this connection that very few operators do understand either the theoretical or practical operation of the spark, and most motors are run with the spark taking place at any other than the correct instant.

A Stromberg carburetor with a central float is used to vaporize the gasoline. The control of the throttle is by means of a foot accelerator only. Thus the speed of the engine is controlled entirely by one lever and that lever operated by foot, making it impossible for the operator to leave the driver's seat and leave the engine racing, as the accelerator has the usual spring return.

The car is designed for a maximum speed of twenty miles per hour, at which speed of the car the piston speed is one thousand feet per minute.

Clutch and Transmission

The clutch is of the leather-faced cone type, 16 in. in diameter and has flat springs inserted under the front end of the leather to allow of gradual engagemeat. The clutch is operated in the usual manner by a pedal, cross shaft and yoke, the yoke arms being fitted with rollers operating against the ball-thrust collar. The connection to the transmission is by a short shaft with two Hartford universal joints, the forward one being of the slip type capable of transmitting 40 h.p. The diameter of the clutch connecting shaft is 1¼ in.

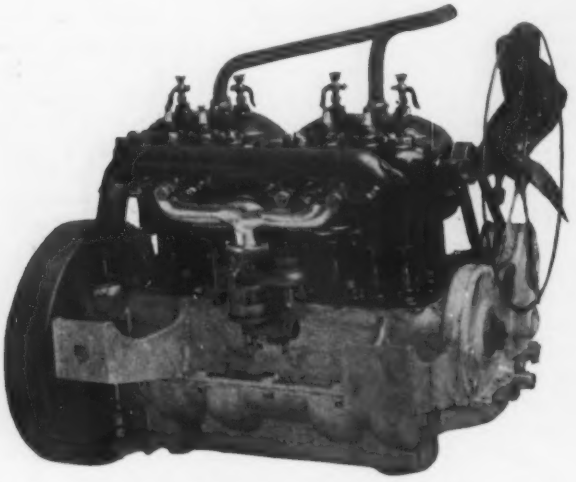


Fig. 2. Federal Truck Motor, Valve Side

The transmission change-gear set is made by the Covert Motor Vehicle Company, of Lockport, N. Y. It permits of three speeds forward and one reverse. The gear ratio from motor to rear wheels on high gear is 7.5 to 1; on second speed, 12.3 to 1; on low speed, 26.5 to 1, and on reverse, 34.5 to 1. The transmission gears and shaft are 3½ per cent. nickel steel. The gear case is of a high-grade malleable iron, the center distance of shaft being 4 in. and the bearings of Hyatt roller type. The gear case is bolted to the differential case of the counter shaft, the sliding members operate on a squared shaft and the engagement of the high speed is by means of a lug clutch. The forward end of this transmission is supported by a bronze casting, forming a double swivel, and is carried by a pressed steel cross arm member, giving flexibility of support, and also facilitating the removal of the change-gear case.

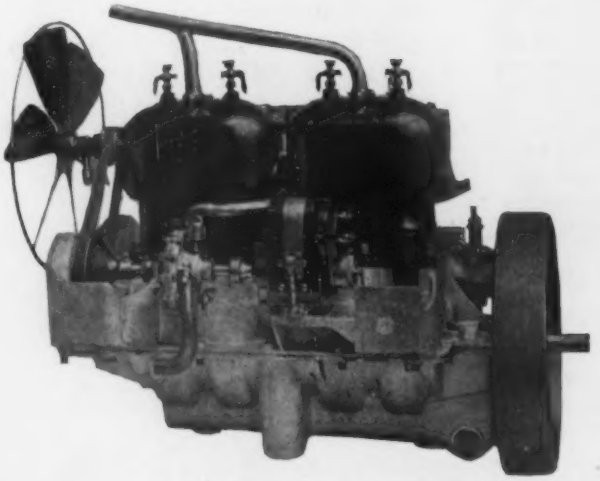


Fig. 3. Federal Truck Motor, Magneto Side

The jack-shaft housing is fastened at each end to the frame by means of a special steel casting, in which the tube of the jack shaft fits. This same casting, which is bolted to the frame cross arms, provides an anchorage for the jack-shaft brakes. The bearings throughout this jack shaft are full length Hyatt roller bearings. The bevel gear has 48 teeth and the pinion 16, making the ratio between these two parts 3 to 1. The diameter of the jack shaft is 1⅞ in. The jack-shaft brakes are of the expanding type and are faced with Raybestos, operating in pressed-steel drums, which are bolted directly to the forward sprockets. A very substantial radius rod, which is a truss like casting, is fastened at its forward end by a steel casting of strap pattern, bolted around the jack-shaft hanger casting. This gives a pivotal mounting, adjustment being by means of a turnbuckle stud. This radius rod at its rear end is pivoted to a plate which carries the anchorage for the expanding brakes on the rear wheels and also the stud for the cam, which expands these brakes. Raybestos is also used at this point for facing, the shoes being of bronze and acting against the cast-steel drum 16 in. in diameter by 1½ in. face. These brakes are very liberal in size; the brake drum and the rear sprockets are integral. The jack-shaft brake is the service brake operated by the foot pedal, the drums being 1½ x 12 in. The rear wheel brakes are the emergency brakes and are operated by the side hand lever.

Fig. 4. Front and Rear Axles of the Federal Truck

Axles, Wheels and Drive

The front axle is of dropped-forged steel, I-beam section with Elliot drop ends, is 2 in. wide and 2¾ in. deep. The spindles are 2 in. in diameter at the base, tapering to 1⅜ in. at the outer end, being 6¾ in. long. Hardened steel bushings are provided where the steering knuckle pin goes through. The rear axle is 2 in. square. The spindle is 2¼ in. in diameter at the base tapering to 1½ in. at the outer end, the length being 7¾ in.

Fig. 5. Controls and Dash of Federal Truck

The wheels are of heavy artillery type, with rectangular shaft spokes. They are 36 in. in diameter and are fitted with Goodyear tires as standard equipment. These wheels are mounted on Timken roller bearings.

The drive is by Whitney roller chains 1¼ in. pitch by ¾ in. in width. The sprockets on the jack shaft have 19 teeth, while those on the rear wheel have 46 teeth.

Other Details

The front springs are pivoted at their forward ends in spring horns which are a continuation of the side frame members, while the rear ends are shackled. They are 40 in. from center to center, 2¼ in. wide and are lipped and banded. The rear springs are 44 in. from center to center, 2½ in. wide, are lipped and banded, and shackled at both ends, the shackled supports being cross tubes with ¼ in. wall, supported in steel castings, riveted to the under side of the frame members, all spring eyes and shackles being fitted with grease cups.

The frame is of channel section pressed steel, very much like that of an ordinary touring car, but considerably heavier. The side frame members are narrowed at the front. Back of this offset the top and bottom webs are divided into a straight line, making them 3½ in. in width at this point. The greatest side-frame depth is at the middle, being 4½ in. at this point. The flange is 1¾ in. and is 7-32 in. thick.

The steering gear is supported directly on this main frame at the narrow portion in front. The engine is carried at the front, under a hood, there being a vertical mahogany dash and seat back of this hood.

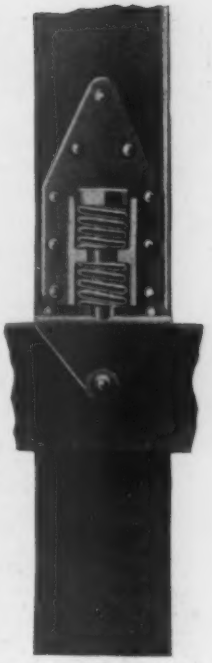


Fig. 7. Federal Radiator Suspension

The gasoline is carried in a tank under the driver's seat. The capacity is twenty-one gallons, with a gravity feed to the carburetor. The steering is by an 18 in. hand wheel on top of a slightly inclined brass column, 1¾ in. in diameter. The gear itself is of the worm and sector type the ratio being 8 to 1. It is mounted on a special casting, bolted directly to the side frame members, and is connected to the left steering knuckle by the usual ball and socket link. Attention is called to the position of the steering arm which is above the front axle and the cross link at the rear of same. Both of these members are by this means protected to a great degree from injury on the road.

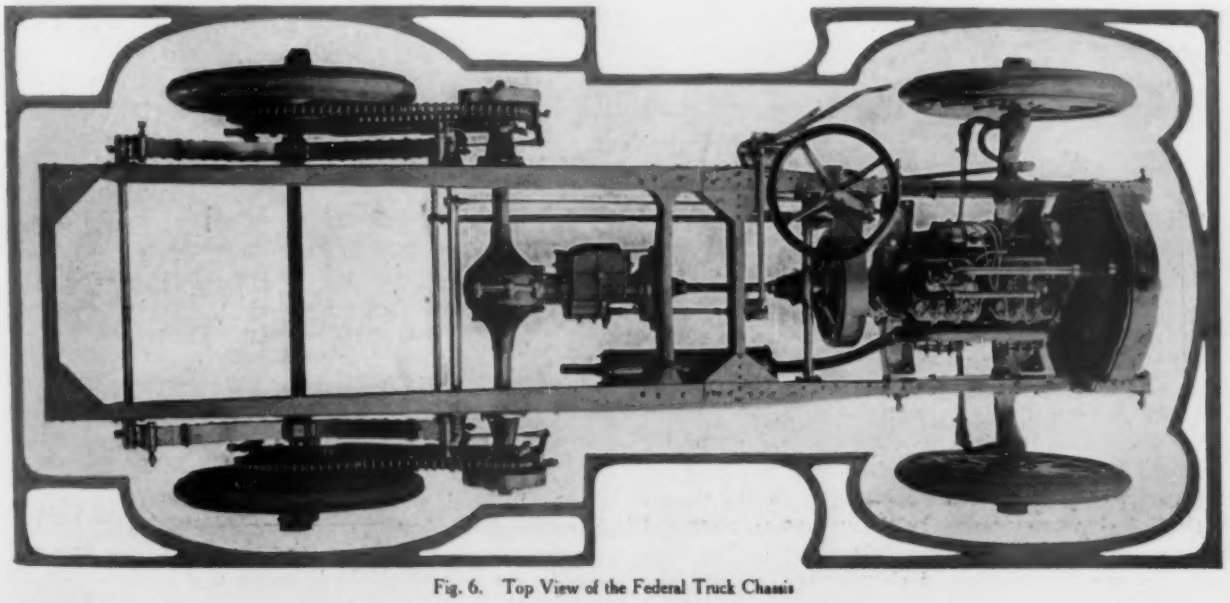
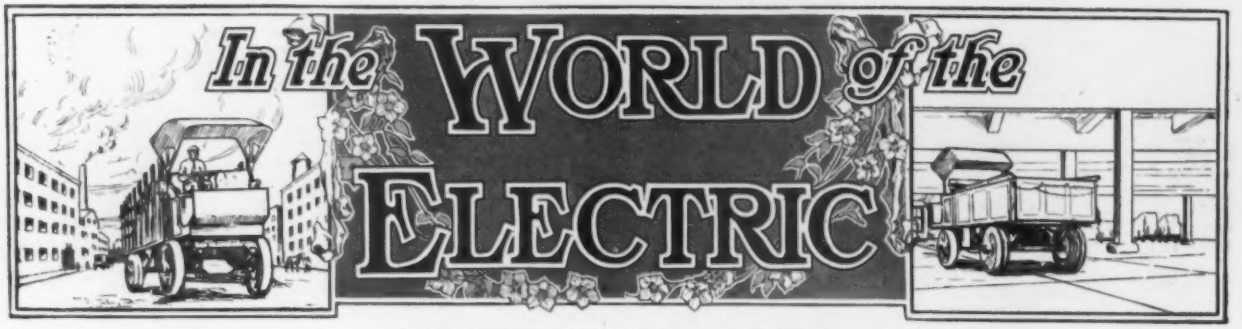


Fig. 6. Top View of the Federal Truck Chassis



CONDUCTED BY HARVEY ROBINSON

ELECTRIC VEHICLE ASS'N OF AMERICA HOLDS SESSION WITH NATIONAL ELECTRIC LIGHT ASS'N

During the week of May 29th the annual convention of the National Electric Light Association was held in New York City, headquarters at the Engineering Society's Building, West Thirty-ninth Street. On Thursday, June 1st, 10 A. M., the report of the Committee on Electric Vehicles was read. This was during the commercial session of the N. E. L. A., at which the electric vehicle people were present. Many points of interest to electric vehicle manufacturers were brought out and subsequently discussed, among which may be mentioned: Tires and their Effect on Current Consumption, it being pointed out that certain makes of tires cause a current consumption 75 per cent. greater than tires causing the minimum use of current. A reduction in insurance on electric vehicles is to be requested on the strength of data obtained by blanks filled out by the Central Station Companies throughout the country. The recent action of the Boston Fire Underwriters in favoring electric garages was also pointed out. Electric vehicle parades were discussed and from reports from various companies it was shown that the demand for electric commercial cars is many times greater than ever before, one well-known maker reporting sales in February, 1911, equal to his total sales for the year 1909 and in excess of all sales made during 1908.

The subject of power appliances on the vehicles was also discussed and methods suggested for keeping records of the current consumption of these separate from that of the vehicle. The vehicle makers sounded a note of warning in regard to the lack of data on up-keep costs and cost of operation, and the suggestion was made that they advocate entry of users' cars in such contests as the National Efficiency and Economy Competition of the Commercial Car Journal, Philadelphia, in which records covering a period of six months are to be kept.

After this session the electric vehicle makers enjoyed a unique luncheon given by the New York Edison Company and served in the new Grand Central Palace Building. This luncheon was cooked entirely by electricity, and electrically illuminated flowers and table decorations were used. At this meeting a very optimistic feeling in regard to the electric vehicle outlook was expressed by the various speakers and plans for co-operation of electric light and electric vehicle makers, in spreading the use of electric vehicles, were discussed. The suggestion was made by Manager Williams, of the New York Edison Company, who presided, that the electric vehicle makers unite with the electric light people in their coming electrical show in the New Grand Central Palace Building.

ELECTRIC DEMONSTRATIONS

A two day demonstration was recently accorded a Detroit business house in a Detroit electric one-ton delivery wagon. The vehicle was equipped with an Edison A6 battery. The first day's demonstration was in the rain. The load carried consisted of chemicals and dye stuffs, the route followed being through the east and west sides of the city. A good share of the first day's run was over unpaved streets. The truck left the store at 8.10 in the morning and finished up at the garage at 5.15, after having been in service 9 hours and 15 minutes, the total of time the vehicle was stopped being 5 hours 45 minutes, net running time therefore 3 hours and 30 minutes. The total distance covered was 40 miles and the stops made aggregated 34. On the second day the truck covered 38 miles and made 34 stops.

The Detroit News, which has quite a fleet of gasoline and electric vehicles, has purchased two more Detroit electric delivery wagons to meet the growing demands of increased circulation, due to the advent of the base ball season. During the summer months it is customary to print base ball extras, and these are distributed throughout the city to the selling stations where the newsboys secure their supply. Shortly after the paper is off the press it is to be had at the outskirts of the town. This sort of service could hardly be provided with horse equipment.

The New Bedford Gas and Electric Light Company, of New Bedford, Mass., is this summer to make many important extensions of its gas service, and in laying the pipes it will save much time by using a three-and-one-half-ton General Vehicle electric truck. The truck is built with a steel floor and is to be used in hauling iron gas pipes from the company's yards and from the freight yards to the places where they are to be laid. The company figures that it can drop many times more lengths of pipe in a day with the electric truck than it can with horse-drawn wagons.

There is every indication that there will be a separate show for commercial vehicles in Boston next year.

Lansden Electric Commercial Cars

BY WILLIAM J. JOHNSON

A TYPE and size for every service is the policy of the Lansden Company, of Newark, N. J., pioneer builders of electric delivery wagons and trucks, the design not having been changed in the past seven years. The present line embraces vehicles of from 350 pounds to five tons carrying capacity.

Those conversant with the commercial ear situation will realize that the Lansden Company was early in the field of electric exploitation and at a time when there was more or less prejudice against electrics in general. Its success is, therefore, all the more pronounced

Silent Features

When one is firm in conviction it means much. The builders then were certain that design and construction were right. It is to be noted that the Lansden cars of those days embodied features of construction now regarded as standard, as for instance, single motor, double side-chain drive, controller on the steering post and of the continuous torque type. The armored wood frame, which is still a feature, was a possible exception, and as for the continued use of this, good arguments are set forth.

Fig. 1. Bakery Wagon Fitted With Cab Front, protecting the driver. Doors and windows can be opened

One General Design

Lansden commercial cars, of whatsoever carrying capacity, are the same in general design, each chassis built in accordance with the load to be transported. For the purposes of illustration, therefore, the one-ton wagon will serve all practical ends. Briefly summarized, this one-ton wagon is equipped with a single motor, chain drive from motor to countershaft and double side chains. Wheel base is 88 in., 100 in. and 112 in., according to the body, tires 32 x 3 in. solid rubber, semi-elliptic springs 36 in. front, 40 in. rear, and on ambulances the new vehicle springs are used. The loading space is 8 ft. 3 in. by 3 ft. 10 in., which can, of course, be varied to suit requirements of the purchaser. This chassis, of course, is to be had with about every type of body. Weight of chassis complete varies according to the battery equipment, the range being from 2750 lbs. to 3750 lbs. The chassis weight proper is 1650 lbs.; body, 500 lbs.; battery, from 600 to 1600 lbs. This weight of wagon is one very commonly used. Ratings of mileage and speed are based on guaranteed performance with full load all the way in average city and suburban service; not full load one way, returning light. Edison batteries are recommended, but lead can be had if desired. The one-ton wagon for city work carries an 850-pound 60 A 4 Edison. For long hauls, as in suburban work, a 1200 pound battery of 60 A 6 is supplied, and will do forty-five miles per charge with one-ton load, or fifty-five miles half loaded. In actual service these vehicles have been known to do ninety miles on a charge and make five hundred stops with a battery one year old. The two and three-ton trucks carry a 60 A 8 battery, weighing 1600 pounds.

Edison Battery

The Edison type battery is used in all Lansden cars, this for the reason that the results have been most satisfactory. The cells are assembled in a sheet-iron box carried between the axles and within the frame, with the weight as far away from the center of the frame span as possible. This serves to more evenly distribute the weight.

Weight Carried Between Axles

The power plant of the Lansden electric is carried between the axles, which is a feature aimed for by many gas engineers to effect easy riding and steering. The motor is just forward of the rear axle. It is obvious that with weight equally distributed, results are sure to be more satisfactory and the vehicle may reasonably be expected to last longer.

Floating Bushings

The Lansden vehicles are built for service, and as the company believes that at least seventy-five per cent. of the roller bearings used in wheels are not properly adjusted, they have fitted all Lansden wagons with a special plain, floating bronze bushing. These are also used on the countershaft. For serviceability they do not believe in the use of alloy or heat-treated steel, which the ordinary blacksmith or repairman cannot manipulate without spoiling. They therefore use only such materials as can be well repaired by the ordinary carriage and wagon repair shop. The bronze bushings of the wheels have a slight "shuck" on the wheel spindles, and are so arranged with spiral grooves on the inside and outside that the grease from the hub cap travels the entire length of the bushing on the otside and in the inverse direction on the inside. This is

Fig. 2. Lansden Ambulance Fitted With Special Helical Springs. These are said to be very easy-riding and are now being tested out on as large as five-ton wagons

possible, as the wheel not only runs on the bushing, but the bushing also turns on the spindle, this giving the floating effect, and, of course, a double bearing surface. As these spindles are about 7 in. in length, the very large bearing surface of the wheels can be realized. A bronze washer or collar fits against the shoulder on the axle, and against this the end of the floating sleeve bears. The nut at the outer end forms a similar bearing for the sleeve end, this nut being cast with veins, so that, in the view from the end of the axle it looks much like a pump. The hub cap, of course, screws onto the hub and is packed with grease. The rotation of the hub cap forces the grease against the veins of the stationary nut just mentioned, and through holes at the base of the veins into the grooves of the floating bronze bushing. Tests show that in a very short period this lubricant travels the entire length of the sleeve and back again, keeping the wheels thoroughly lubricated.

One New York concern ran these vehicles between forty-two thousand and fifty thousand miles, covering a period of four years, before renewing the bushings. Ordi-

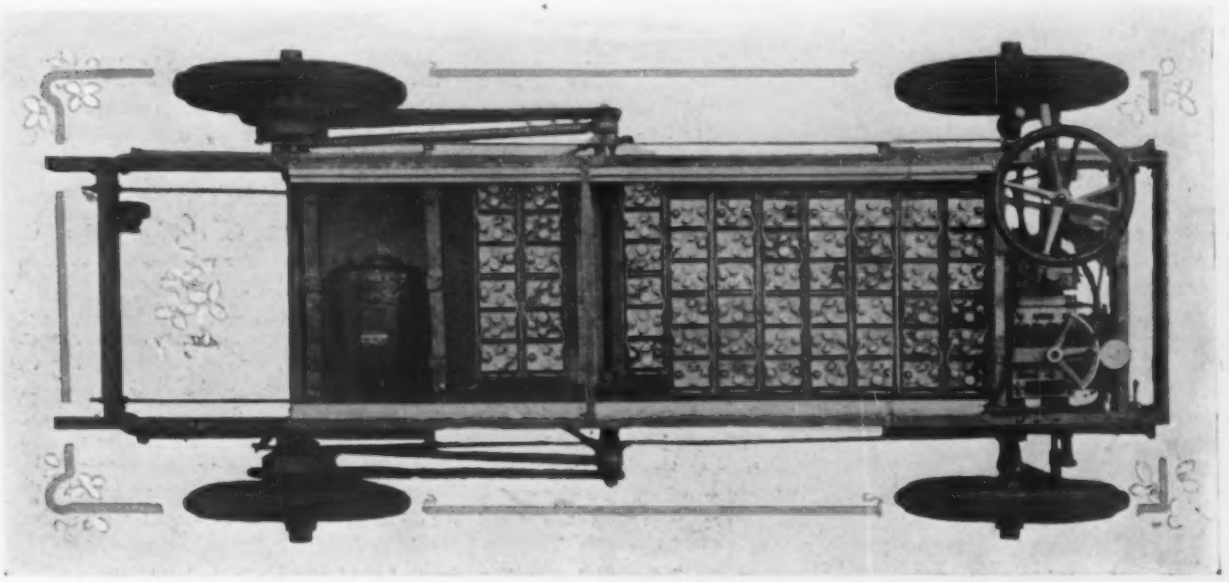


Fig. 3. Top View of Lansden Chassis, showing arrangement of Edison battery and single motor. Attention is called to the spring-blade jack shaft

Fig. 4. Resistance and Controller Operating Gears. Full gear is connected to the controller, which is carried in a box below the frame

narily one filling of a cap lubricates for six weeks, but wheels have run a year without detriment, without being touched. Roller equipment can be had if desired.

Motor

The motor, as previously mentioned, is carried forward of the rear axle, and supported at four points by two angle iron cross members of the frame with ends slotted to fit in brackets at the sides. The driving sprocket is on the right side and driven to the countershaft through a roller chain. To compensate for chain slack or adjustment, the motor may be drawn towards the rear by two steel rods which are retained with lock nuts, to the rear cross member of the frame. The entire motor can be quickly slid backward and dropped out of the frame. These motors are larger for the truck's capacity than generally used.

The differential is carried on the right side of the vehicle and, with the sprocket assembly, is fitted with bronze floating sleeves. The sprocket and differential shafts are supported in brackets on the frame sides.

Double Side-Chain Drive

Final drive is through double side roller chains, one inch pitch. The rear sprockets are bolted to the brake drums. Two radius rods, tubular, 1¾ in. in diameter, provide means of adjusting the driving chains, these extending from the sprocket shafts where they are anchored by eccentriclike straps or solid eyes. At the rear they are attached to collars of the rear axle. The springs do not transmit any driving effort.

Armored Wood Frame

This car differs from others in that an armored wood frame is used, this being a feature of all Lansden models. This type is employed because the builders regard it as superior to steel or iron frames likely to take a permanent set in case of accident. This Lansden frame is strongly cross-braced and fitted with armor plates. The claim is that in commercial electrics in use for the past six years no frame has shown imperfections, or failed in its mission.

Wheels

Wheels are wood-designed and built in accordance with the model. On the one-ton wagon they are 32 in. in diameter fitted with solid rubber tires, 3 in. in diameter. Bearings are bronze floating sleeves, as outlined above. If the owner of a Lansden suffers an accident and needs another wheel, he may substitute a rear for a front, as the members are interchangeable. The wheel hubs are of steel.

Axles

Lansden axles are drop-forged steel with plain wheel pivots, both front and rear axles on the one-ton wagon being 1¾ in. square. The company asserts that though the car weight is lower than in vehicles of other makes the axles are actually larger; a factor of safety, and which, with smaller wheels than are generally used, provides greater strength to cope with curb thrusts and the like. Since the floating sleeve is used for wheel bearings, there is no need of adjustment, and, as the members are self-lubricating, a minimum of attention is required.

Springs

On the one-ton wagons the springs are semi-elliptic, the helical members above referred to being used on a five-ton model. These semi-elliptics are 30 in. long front, ten leaves 2 in. wide. The rear springs have eleven leaves 2 in. wide, the sets being forty inches long. Both front and rear sets are secured to drop-forged hangers on the frame sides, the shackles being of the heavy side plate type. The axle

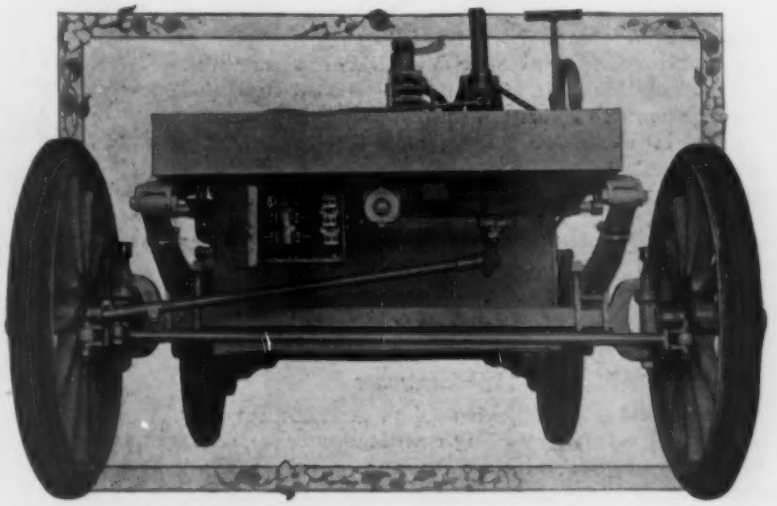


Fig. 5. Showing steering connections carried in front of the axle; charging plug receptacle at the center; controller, continuous torque, drum type, at the right, showing its accessibility

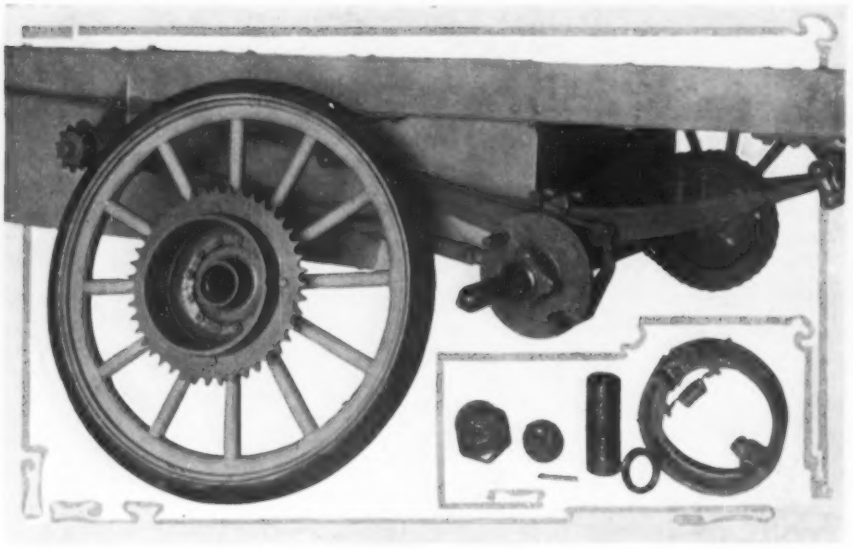


Fig. 6. Rear-Wheel Assembly, showing expanding brake, floating sleeve or bushing, and brake drum and sprocket

spring seats are separate members, the retaining clips being half-inch wide.

Steering

Steering is from the left, the post in the one-ton car being 1⅞ in. in diameter, fitted with a 16 in. hand wheel. The system is of the rack and pinion type, gears two in. face, the assembly housed in a cast-steel case of heavy webbed construction, support being through the top section of the case at two points to a cross member of the frame. The steering rods are carried forward of the axle and are fitted with ball and socket joints. The front axle has formed integral with it the steering yokes. The steering spind'es are 1¼ in. in diameter. The knuckle pins are lubricated with grease cups.

Brakes

There are two brakes on the rear wheels, these internal expanding, fully enclosed, the drums being bolted to the wheels. On the one thousand pound car these are 10 x 3 in., on the two-ton wagon 12 x 3½ in. The brake assembly is supported onthe rear axle. Action is through steel pull bars ⅞ in. in diameter, connected with a full stirrup pedal which may be locked in position or instantly released by the foot. Common practice favors the equalizing of brakes, but here the contrary is the case, the argument for such being that should a brake rod be snapped in an accident both brakes would be rendered ineffective; whereas, with independent action, such would not result. The expanding bands are anchored on a pivot at the top of the brake disc, the slot being elliptical, allowing a slight movement of the band on its pivot so it can engage the entire circumference of the drum, final action being through a steel wedge and a drop-forged lever.

Drum-Type Controller

A three-speed controller is used on the various models. It is of the drum type, affording a continuous torque. There are only six fingers, which are 500 v., copper drop forged, with no break in the circuit in pa sing from one to another speed. The instrument is housed in a metal box under the frame forward, where it is easily reached without raising the floor boards. The box is fitted with a cover plate held in place by wing bolts. The controller is worked through a segment and full gear of wide face. The segment has three spokes, to the center of which there is anchored the yoke draw bar, which is connected to a long arm attached to the vertical controller post on the steering column. There are no wires in the vehicle body, these being carried within the chassis. Initial control effort is imparted through a horizontal hand lever under the steering wheel. A lever lock switch is located to the right of the steering post; the driver, on leaving his car, has only to withdraw the lever, and it is certain that no one else will be able to operate the vehicle. The lever is sufficiently small to be carried in one's pocket. All cables are heavily insulated. An ampere-hourmeter on the dash shows how far the car can run and how much will be required to change it.

Narrow Tread

Tread in the one thousand pound and one-ton electrics is 56 in., thus providing a short turning radius. It will

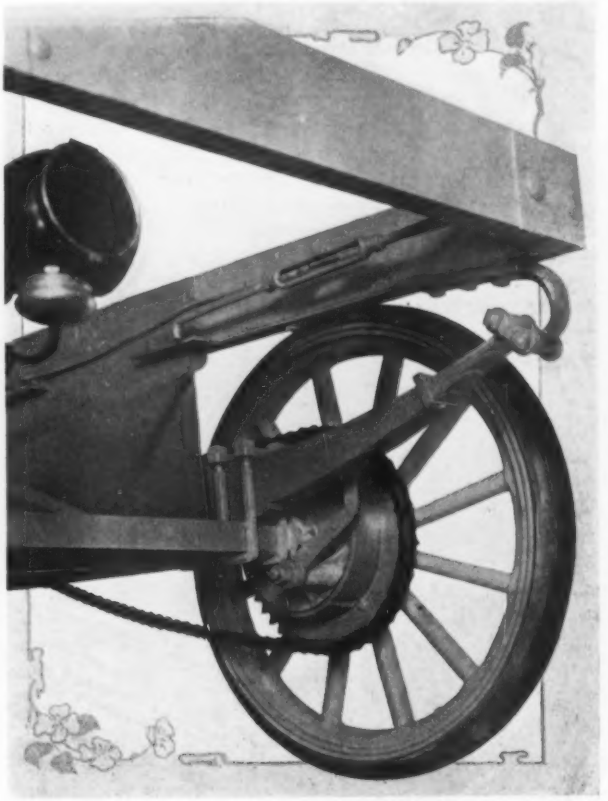


Fig. 7. Rear View of Lansden Chassis, showing brake lever; graded spring turnbuckles shown at top of frame, adjust tension of motor chain

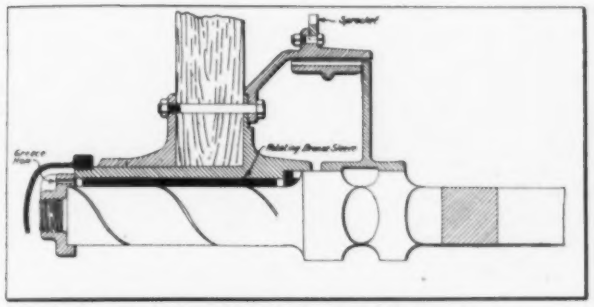


Fig. 8. Detail of Lansden Self-Oiling Wheel Bushing; also showing the hub, drum and sprocket

be noted from the accompanying illustrations that there is no pronounced overhang. As the frames in these two cars are narrow, the wheels can be set at a greater angle, thus simplifying the steering, especially in close quarters. The road clearance is 12 to 14 in.

Accessibility

The working elements of the car are easily reached when necessary. The controller, for instance, located under the car, forward, is gotten at by removing the door held by wing bolts. The kick-switch housing is under the floor boards, and the brake rods are carried outside the car and along the battery box. To remove the wheels is a simple matter and the chain adjustments are easily made through the two side distance rods. The steering connections being in front of the axle, are in a handy position for adjustment. The differential, carried on the right side of the frame, is also easily reached.

The price of the Lansden cars is, to a great extent, governed by the battery and type of body fitted. Body treatment is most comprehensive and embraces about every desired type. Fitted with express wagon bodies, the three-ton truck is $3600, the one-and-a-half-ton truck is $3450, and the fifteen thousand pound truck is $2450. Prices, however, are usually given on the chassis only.

USES ELECTRIC COMMERCIAL CAR TO HOIST SAFES

The accompanying illustration is interesting in that it sets forth the use made of an electric delivery wagon in hoisting safes. This vehicle, a Waverley electric, is in the service of Lilly & Stalnaker, of Indianapolis, Ind., who have been using

Electric Commercial Car Raising a Heavy Safe Into an Upper-Story Window

the truck for this purpose for some time past. Instead of hoisting by hand windlass, a long rope from the block and tackle is attached to the car, which is then run down the street and the safe hoisted in short order. The performance is repeated with various other heavy articles to be raised to upper stories of high buildings. In this manner the work is quickly performed so that the truck serves a double purpose.

LOUISVILLE ELECTRIC VEHICLE COMPANY

The Electric Vehicle Company, of Louisville, Ky., has been incorporated with a capital of $10,000 for the manufacture of electric commercial cars. The plans made thus far include the manufacture of a light delivery truck in two sizes —600 and 1,000 lbs. load capacity. After placing these on the market a heavier truck will be produced.

THE ELECTRIC DELIVERY WAGON MUCH IN FAVOR FOR DRY GOODS STORE SERVICE

It would appear from a careful survey of the field of production that the light electric is gaining much ground, especially in the delivery of merchandise by large dry goods houses.

An interesting installation is that of Mandel Brothers, of Chicago, who shortly before Christmas, last, put in service a Lansden 1000 pound light delivery wagon fitted with a special body. This car in actual service made 72 miles on a single battery charge with load, and the average daily mileage is 60 miles. On the trip on which 72 miles was made, there were 300 stops during the delivery of the load. The vehicle is a regular Lansden stock wagon fitted with double chain drive, single motor and 60 cells of Edison battery, A6.

The body of this vehicle is something of a novelty, in that sides and back are solid. The front seat is made in two sections, one of which is tilted when the driver desires to get into the body of the vehicle. This rather makes for a cleaner interior.

THE GENERAL VEHICLE COMPANY, with headquarters in New York, in the case of a recent sale to the United States government of several large electric vehicles, sent an expert to Manila with the wagons in order to give instructions as to their operation and care. The General Vehicle Company considers its maintenance department one of the most important features of its business and has a large force of men, headed by a competent engineer, whose business it is to look after its trucks all over the country.

Electric Lamp-Trimming Wagons

LAMP TRIMMING on the newly erected twin lamp-poles in the central section of the city of Philadelphia proved to be quite a problem. As a temporary makeshift, a twenty-four foot two-section ladder was set on a quadrant, placed in the body of an ordinary express-type wagon and so arranged that the ladder could be swung to either side, or made to assume an upright position. This arrangement answered the purpose, but necessitated the expense of a horse and driver in addition to the trimmer.

The design and construction of an electric tower wagon was then considered, but the main difficulty was to devise a plan to obviate the necessity of having an extra man to do the trimming, as otherwise the driver would be compelled to climb to the top of the tower to trim each pair of lamps. At the suggestion of Mr. A. H. Manwaring, engineer of arc lighting, of the Philadelphia Electric Company, a tower wagon was designed that could be operated from either the upper platform or the driver's ordinary position at the floor level, and equipped with a turn-table at the top to enable the operator to trim the lamps on both the street and house sides of the poles. The Commercial Truck Company, of Philadelphia, collaborated with Mr. Manwaring, and produced the wagon illustrated.

The upper picture shows the Wagon used in Philadelphia, while the lower picture shows New York's outfit

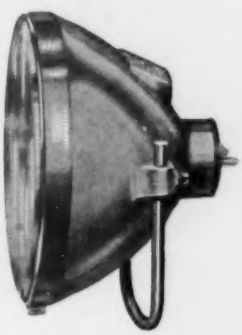
This is constructed on the ordinary 500-pound chassis. Weighing without the tower and including the battery, 2600 pounds. The tower weighs 650 pounds, making a total weight of 3250 pounds. The vehicle is equipped with a forty-two cell, seven-plate Philadelphia storage battery, which will furnish an average speed of fifteen miles per hour on the level, and has a mileage capacity of thirty miles per charge. The wheels are equipped with two and one-half inch by thirty-six inch Firestone tires, both front and rear. The controller is mounted on the upper platform, and can be operated from either the upper or lower seat by a tube outside the steering shaft. The reversing mechanism is a Z-slot bushing keyed on the controller tube, which is worked from the upper seat by the foot and from the lower seat by the hand. The steering gear is mounted in the usual manner and is worked from the upper or lower seat by a shaft which runs through the controller. The brakes can be worked from the lower seat by a foot lever in the usual manner, and from the upper seat by a foot lever rod and bell crank. The upper foot lever has an extension, so that the operator can set the brakes from the top seat, climb down and release the brakes from the lower seat, or *vice versa*. The electric bell is operated from either the upper or lower seat by a floor push in the toe-board. The platform is thirteen feet six in. from the ground, and an additional height can be secured by hanging a portable stand from the side rails, which will increase the height to either fourteen ft. or fifteen ft. six in., depending on which rail is used.

A test of stability of the machine was made by suspending a weight of 700 pounds from the end of the platform when turned in the position occupied by the trimmer in trimming the lamps. This test was made before the battery was installed and proved the stability of the tower wagon under the most severe working conditions.

The tower wagon has been giving very satisfactory service, and enables the trimmer to cover each of his routes in approximately six hours, while by the old method nine hours were required to accomplish the same results.

The new method shows a daily saving in the cost of transportation and labor of approximately 33⅓ per cent. over the former method of using a horse-drawn wagon and motor cycle, and in addition to this the tower wagon has a decided advertising value, as it attracts a great deal of attention on the streets.

In New York City, a somewhat similar, but not so convenient an equipment, is in use. The accompanying illustration shows a tower wagon of the New York Edison Company, one of the foremost exponents of the electric commercial car in this country, in use by the lamp trimmers along that exclusive thoroughfare, Fifth Avenue. The elevated platform on which the trimmer is standing can be raised and lowered at will. This equipment has been found to work out very well.



The "Electrobola"

The "Cross" Oil Lamp

The "Cross" Electric Lamp, Type 1000

The "Star" Headlight

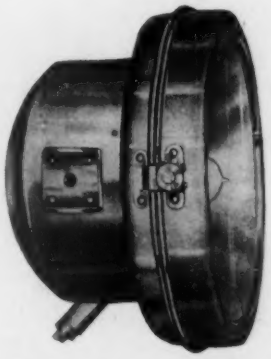
fount, lock nutted and a one piece aluminum reflector. The price of this lamp, which is known as type 45, lists at $5. The electric lamp type 1000 is made of heavy brass throughout, heavy plate glass lens, silver reflector and fitted with G. E. sockets for upright standard bulbs. This lamp is particularly adapted to delivery wagons and smaller size commercial cars. The diameter of the front is 7½ in.; diameter of the body, 6 in.; lens 5 in., and height 9 in. It lists at $12.50. This concern also makes another lamp similar to type 1000, made of heavy brass black enamel, silver reflector and horizontal socket, to be wired through dash. Both lamps are similar in appearance and are so made to withstand the hard usage to which they are exposed.

THE MILWAUKEE BRONZE CASTING COMPANY, 119 Clinton St., Milwaukee, Wis., manufactures the "Star" electric headlight made of thick, non-corrosive silver aluminum. The 8 in. size is especially recommended for commercial cars. The body of the lamp is in one piece, thus it will not shake all to pieces from the vibration of the car. There is no sheet metal used in its construction and no soldering of parts. The bulbs are held in place by a security socket preventing any chance of them becoming loose. The combination reflector used in this lamp diffuses the light all over the road with an intense light focused dead ahead. This lamp is fitted with 10, 16, 20 and 25 candle power, Mazda bulbs as desired. The finish is in black enamel or silver, with nickel plated or brass trimming as desired.

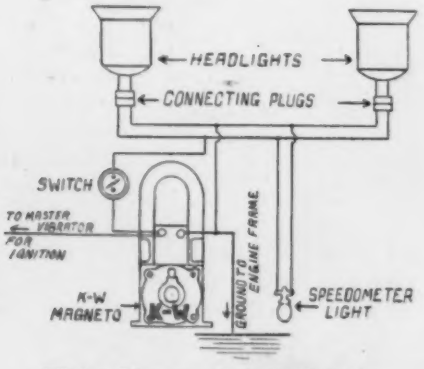
THE K-W IGNITION COMPANY, of Cleveland, O., is featuring a special electric lighting outfit for commercial cars, called their "$50.00 Road Lighting Outfit." This system includes a low tension magneto, pair of lamps, bulbs, ten ft. duplex wire, and switch, all for $50. Special attention is called to the fact that this system does not require a storage battery of any kind, or a cutout, as the lights are run directly from the magneto and the magneto regulates the lights perfectly, so that no governor is required. The body of the lamp is of one piece heavy brass, highly polished, and has a true parabolic reflector of burnished silver of sufficient size to catch all the rays and throw them forward on the road. The reflector is not spun but drawn with steel dies, this giving an absolutely true parabola. The parabolic reflector acts as a lens which concentrates the light and throws it all forward in one large beam.

The magneto is of the low tension type, and can be used on any machine where there is a place to mount it, so it runs at about 3500 r. p. m. The manufacturers state that these outfits are used extensively in the West on traction engines and usually one lamp is mounted as a headlight in front and one at the rear for the plows.

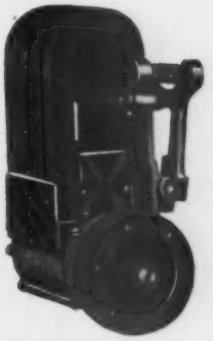
THE C. T. HAM MANUFACTURING COMPANY, of Rochester, N. Y., catalogs two lamps made of steel which adapts them particularly for the rough usage they get on commercial cars. These lamps are known as the "Tourist" and "Meteor" models. They are finished in black enamel and present a very handsome appearance. This company is making a special lamp with steel body, the door, dome and fount being made



The K-W Electric Searchlight



Wiring Diagram of the K-W Outfit



The K-W Low-Tension Magneto

of brass, giving a very handsome appearance. The "Tourist" lamp is somewhat larger than the "Meteor," otherwise the construction is similar. The "Tourist" is 14¾ in. high including bail, while the width is 7 in. It holds sufficient oil to burn 27 hours. These lamps are of course made with the "Cold Blast" principle, which prevents smoke, soot and sweating of the lenses.

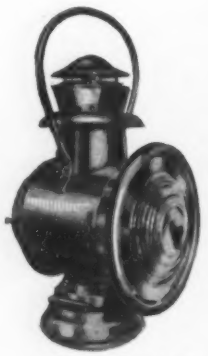
JOEY-MELL, 1408 Michigan avenue, Chicago, Ill., manufacture the Joey-Mell exhaust horn. This horn is made of aluminum, and weighs but one lb. This horn is extremely loud and does not produce a musical tone, it giving a report like a revolver. It can be installed on the exhaust pipe, under the foot board and ahead of the muffler. It is fitted with a removable tongue, which allows "tuning" to the exhaust of each motor. The Joey-Mell works equally well with any number of cylinders, and on farm tractors, etc. The price of the complete outfit is $6.50.

THE GRAY-HAWLEY MANUFACTURING COMPANY, of Detroit, Mich., calls particular attention to its "Autolarm," a signalling device operated from the exhaust. The Autolarm is built to withstand unlimited vibration. It is clamped on the exhaust pipe between the engine and muffler, which the makers claim to be the correct place, as it does not cause back pressure in the muffler or cause the tail pipe to jar loose. The device can be easily fitted by simply cutting a notch in the exhaust pipe. The horn is self-cleaning. To blow the Autolarm, the foot-pedal which is connected to the lower lever or valve with a cable, is depressed.

This pulls the V end of the valve out of the slot and the exhaust passes through and over the sound openings. The upper end of the valve raises at the same time, and if the pedal is pressed further it projects into the exhaust pipe through the notch and deflects more of the exhaust through slot and over sound openings. This arrangement permits taking the amount of exhaust desired to blow the Autolarm regardless of the speed of the engine. If, when blowing the Autolarm, some soot gets into the slot, quickly closing and opening valve will remove it.

The Autolarm is made to fit all pipe sizes from 1 to 3 inches, and lists from $6.50 to $9.00. This concern also makes another exhaust signal called the Autochime. This is a single tube chime and is attached to the end of the muffler. The Autochime valve permits taking the amount of exhaust desired regardless of engine speed. The exhaust not used passes freely into the muffler. The Autochime is made in two sizes. The prices are from $6.50 to $9.00 according to pipe sizes.

THE THEO. H. GARY COMPANY, 41 Union Square, New York City, manufactures the "Grack-Unicum" electric horn attachment, which can be fitted to any regular bulb horn. This device is operated from the ignition storage battery or a battery of 5 or 6 dry cells. The working parts are enclosed in a compact spun metal casing, is absolutely moisture and dust proof; only the binding posts and adjusting screws are on the outside. The case has a standard thread, to which any horn may be screwed, after the reed and tube are screwed off, making a perfect unit. The attachment is 3¼ in. in diameter and 3 in. long, and is small enough to be attached to any horn. The electricity, acting magnetically, produces vibrations which are transmitted mechanically to a diaphragm where they are magnified. After having been condensed in the metal horn they go out into the air with a loud, penetrating tone. A set of wires comes with the apparatus, two ends of which are to be connected with the binding posts of the attachment, the other two ends with the source of electricity (storage battery or a battery of five or six dry cells). Not more than five or six volts are required, and the sparking battery may be used. The push button is attached to the rim of the steering wheel by a little belt at its back. The attachment without horn lists at $15; with bugle horn $20, and with Dragon horn as illustrated, $22.50.

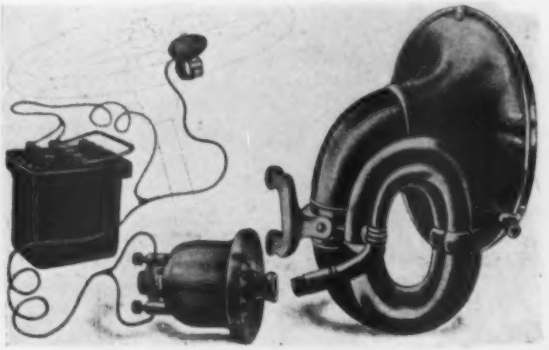


Ham "Tourist" and "Meteor" Models

The "Joey-Mell"

The "Autolarm"

"Nonpareil" Horn No. 100



The "Grack-Unicum"

The "Russel" Model D

Riley-Klotz Horn No. 34

Riley-KlotzTaxicab Horn

Standard No. 326 Special Taxicab

THE RUSSELL ELECTRIC COMPANY, of Danbury, Conn., manufactures an electric horn specially designed for commercial car service, and known as Model D. It is fitted with a long oval horn which gives a very clear and deep note, and has a 4½ in. diaphragm of blued steel which cannot bend or get out of shape. The horn is finished in full brass highly polished. It can be attached to either side of the car, operated by dry or storage batteries, 6 to 12 volts. The horn illustrated lists at $15. Another model with shorter horn is furnished at $12. Both models are made of extra heavy metal, making them strong in every way.

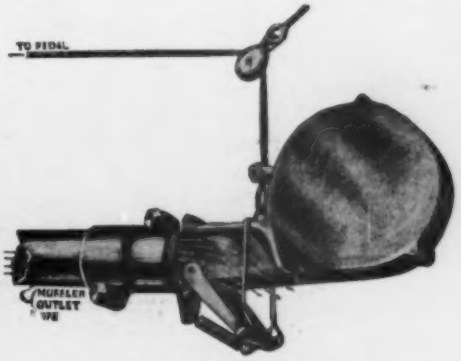
THE RILEY KLOTZ MANUFACTURING CO., 17-19 Mulberry St., Newark, N. J., manufactures a number of styles of horns for taxicabs and commercial cars. The taxicab horn illustrated herewith is of extra heavy construction and is fitted with an oval bell. The bell is fitted with a wire screen. One of their regular styles for commercial cars of all types is also shown. The diameter of the bell is 6½ in., and it is especially adapted to fasten on the side of the car near the driver's seat.

THE STANDARD METAL MANUFACTURING COMPANY, of Newark, N. J., is cataloging two horns for commercial cars —No. 255, taxicab or small wagon horn and No. 326, special taxicab or truck horn. No. 255 has a very strong clamp bracket that is clamped around the tube instead of being soldered to a small post as is usual. It is also made with a special bracket to be placed under the seat if so desired. The horn is fitted with a 5 in. bell, and is japanned or rubberoid finish baked on. It lists at $3.50. The No. 326 horn is also made with strong clamp to keep it from jarring apart, and is finished black on order. It has a 6 in. bell and lists at $6.00. Also furnished with a 7 x 5 in. oval bell at advanced price.

THE RANDALL-FAICHNEY COMPANY, 251 Causeway Street, Boston, Mass., offers its well known Jericho exhaust horn for commercial car use. This horn is operated by the exhaust, and produces a penetrating tone which can be heard a great distance ahead. It is operated by a pedal located on the foot board. The horn is made of aluminum, and the largest size (11 x 5 in.) weighs, inclusive of attaching coupling, approximately three lbs. When the horn is not in use the exhaust flows freely through the open horn throat, while depression of the pedal closes the lid, directing the exhaust through a shallow slot and across the sound chamber opening. The prices are from $7 to $10 according to size.

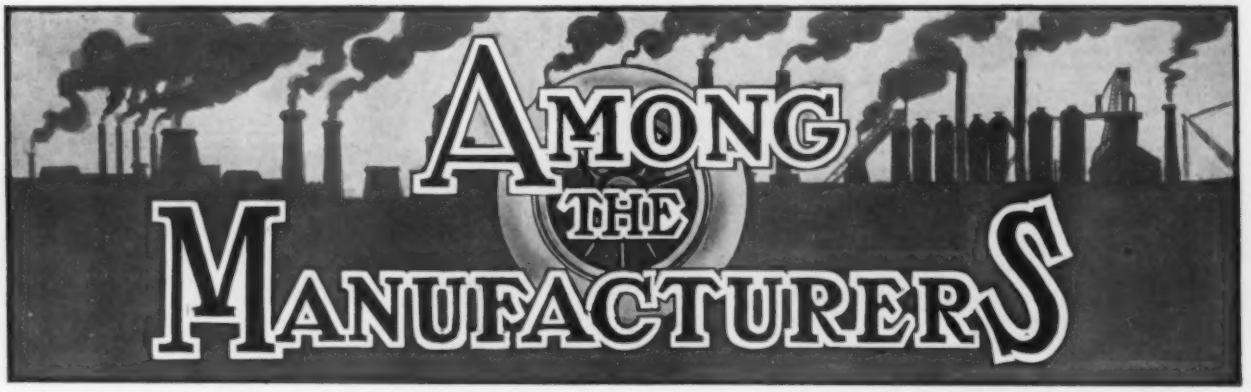
THE AMERICAN ELECTRIC COMPANY, Fifty-eighth and State Streets, Chicago, Ill., manufactures the Samson Electric Horn, which is especially designed for commercial car use. The case is a heavy brass casting, and the projector is of spun brass. The horn is operated on four dry cells or a six-volt storage battery. The intensity and volume of sound can be varied at will to suit all conditions. The horn is dust and moisture proof, and requires no lubrication. A condenser is used, preventing sparking at the platinum contacts. A special dustproof and waterproof push button and twelve feet of flexible rubber covered duplex wire, with brass mounting bolts are furnished with every horn.

Standard No. 255 Taxicab



The "Jericho" Exhaust Horn

The "Samson" Electric Horn



LOCOMOBILE COMPANY OF AMERICA TO BUILD COMMERCIAL CARS

The Locomobile Company of America is keeping abreast of the times and is going to inaugurate a department for building and selling motor trucks. It is planned to go into the business extensively, which will mean an ultimate increase in the output of the plant and a general increase in business and employes. Nothing definite as to the plans of the truck or as to how extensively the work will be at the start, is being given out. Experimenting is now being carried on with a model to determine the workings of several parts and to have it the highest point of efficiency before placing it on the market.

J. T. Roche, Jr., for many years purchasing agent of the concern, has been announced as the sales manager of the new department. The truck will be presented to the public as a credit to the "Made in Bridgeport" slogan, and is expected to occupy a niche in the motor truck world of a like standard as the Locomobile does in the field of pleasure cars.

COMMERCIAL CAR PLANT FOR SOUTH HOUSTON, TEXAS

The Commercial Motor Car Company, of San Antonio, Tex., an organization capitalized at $100,000 and backed by strong financial interests, has closed a deal for the outright purchase of a manufacturing site in Houston, where its full equipment will be removed to. The company will make a specialty of a four-wheel drive commercial car.

The officers of the company are: Z. Z. Brandon, president; W. E. Tyford, vice-president; L. J. Brandon, secretary and treasurer. The board of directors will be the following gentlemen: Z. Z. Brandon, W. E. Tyford, L. J. Brandon, W. C. Berry, H. O. Skinner and Dr. Aiken.

ECLIPSE ONE-TON COMMERCIAL CAR

The Eclipse Truck Company, of Franklin, Pa., has placed on the market a new commercial car of one-ton capacity. The motor is of the four-cylinder water-cooled type with cylinders 4 x 4 in., developing 25 to 30 h. p. at 1,200 r. p. m. The motor is located under the foot-board with the radiator in front, which is protected by a heavy bumper formed by a forward extension to the frame side and end.

LOZIER TO BUILD COMMERCIAL CARS

The Lozier Motor Car Company, of Detroit, Mich., are preparing to enter the commercial car field. About September, Lozier trucks will be placed on sale at the various agencies and branch houses throughout the country.

While Lozier is one of the last of the big makers in the field with trucks, the company has been experimenting for a number of years past. At the Plattsburg factory, two years ago, experimental trucks were in service on the road and preparatory work has been going on ever since. These trucks are now in service in Detroit and the building of vehicles for the market is now being carried on in the new Detroit plant. A number of the best features of some of the successful foreign trucks used in army service abroad have been incorporated. The mechanical details, capacity and prices have not been announced, but the trucks will be of large carrying capacity.

ANOTHER SOUTHERN COMMERCIAL CAR MANUFACTURER

The Van Winkle Gin and Machine Company, of Atlanta, Ga., a home concern backed by home capital and known throughout the South, has just entered the commercial car field. The company will engage in the manufacture of commercial cars on an extensive scale, and will offer cars with carrying capacities from 1,000 lbs. to five tons. A regulation platform body will be furnished as standard, although any style of body can be had to order, according to specifications by the purchaser.

DETROIT HAS ANOTHER COMMERCIAL CAR

The Commercial Motor Car Company is the latest addition to Detroit's long list of automobile manufacturers. The new concern will market a 1000 lb. friction driven commercial car for $725, and has secured a plant 260 x 60 ft. at Solval and Fort streets. The motor will be four cylinders, 20 h. p., chain driven to rear wheels. Bosch magneto, 96 in. wheel base, 36 in. wheels, 2 in. solid tires.

A. O. SMITH COMPANY TO MAKE COMMERCIAL CARS

The A. O. Smith Company, of Milwaukee, Wis., the well-known makers of pressed-steel frames, are planning a commercial car. They expect to have it ready for the market early in the Fall.

CAMERON AIR-COOLED COMMERCIAL CAR

The Cameron Car Company, of Beverly, Mass., has placed on the market two types of commercial cars of one-ton and one-half-ton capacity. These machines are fitted with air-cooled motors under the seat. A special Cameron transmission system is used, which has been employed on the Cameron pleasure cars with success for some years. The motor is controlled from the right side. The motor has four vertical cylinders with the cooling flanges cast integral, and is fitted with valves in the head horizontally disposed and operated by rocker arms. Direct drive is on all three forward speeds, final drive being by side chains from the jack shaft sprockets to the rear wheels. The flare-board express body measures 8 ft. 6 in. back of the driver's seat and is 4 ft. in width. The wheel base is 108 in.

PORTLAND, ORE., TO HAVE NEW PLANT

The Doyle Automatic Truck Company is the name of a new concern located in Portland, Ore., and which has just completed its first three-ton commercial car. The body is especially low, the floor being just 26 in. above the ground. The wheel base is 124 in. The front wheels are 32 in. x 4 in. and the rear ones 40 in. x 4 in. The motor is of four cylinder type, with 4¼ in. x 4¾ in. cylinders. Two special models being built by the new concern are for sand and gravel hauling. The first one that will be completed will be with an end dump, while the next one will drop its load in the center. This is made possible by putting the engine in the rear.

The officers of the manufacturing plant are: C. D. Ross, president; J. C. Doyle, vice-president and A. H. Brown, secretary and treasurer. Mr. Doyle is the designer of the vehicle.

POPE MANUFACTURING COMPANY TO MAKE COMMERCIAL CARS

It is stated that the Pope Manufacturing Company, of Hartford, Conn., is preparing to enter the commercial car world. It has plans for a three-ton vehicle.

NEW ADDITIONS FOR ADAMS TRUCK PLANT

The Adams Brothers Company, of Findlay, O., manufacturers of the Adams one-ton commercial cars, are putting up another addition to their present plant which they will use for frame assembling. This building, 87 x 200 ft., will give them about 18,000 ft. additional floor space.

BEAVER COMPANY NOW MAKING COMMERCIAL CARS

The Beaver Manufacturing Company, 783 Chase street, Milwaukee, Wis., the well-known makers of motors, are now making commercial cars. The demonstrator is now on the road.

THE STEPHENSON MOTOR TRUCK COMPANY, of Milwaukee, Wis., has been incorporated with a capital of $300,000. The incorporators are A. E. Halderman, H. F. Friedrick and Paul D. Durant.

PNEUMATIC SUSPENSION WHEEL COMPANY

The Pneumatic Suspension Wheel Company has been incorporated with $250,000 capital, to manufacture wheels for motor trucks which it claims will displace rubber tires. The company has a plant at Stamford, Conn. Directors are: John Joyce and F. N. Morley, Boston; H. H. Melville, James G. Batterson, John Stanton and Charles W. Miller, New York, and John J. Roche, Stamford.

FEATURING TWO-CYCLE DELIVERY WAGON

A two-cylinder opposed, two-cycle, planetary transmission delivery wagon is featured by The Motor Wagon Company, of Detroit, Mich. The concern, it is said, will have cars on the market in June. A factory is now being equipped. Strathearn Hendrie is the president of the new company, W. H. Muir secretary, and Fred M. Alger, treasurer. The principal stockholders include Russel A. Alger, Frank C. Croul, P. H. McMillan, William and George Hendrie and S. R. DuBrie, the designer of the vehicle. Mr. DuBrie is one of the oldest two-cycle engineers in the United States and has been identified with various concerns as designer.

ANOTHER NEW LIGHT DETROIT CAR

Pratt, Carter, Sigsbee & Company are the latest arrivals in the manufacturing field in Detroit, Mich. The preliminary arrangements have been made and the new concern is to be incorporated shortly. The company is now building a first lot of ten of these cars. This is a single-cylinder friction-drive delivery car of eight hundred pounds capacity and is to sell in the neighborhood of $750. A model car has been on the road for some time past, and very good results are said to have been attained. Warren C. Pratt, who until recently was identified as Columbia sales manager with the Detroit branch of the United States Motor Company, is one of the prime movers in the venture.

CASE MOTOR CAR COMPANY CHANGES NAME

At a meeting of the stockholders of "The Case Motor Car Company," held May 12, 1911, a resolution was unanimously adopted changing the name of the company to The Auglaize Motor Car Company. This action was taken to avoid any possible conflict between this company and another manufacturing concern bearing a similar name and manufacturing a similar product. In the future all motor trucks manufactured by this concern will bear the name "Auglaize."

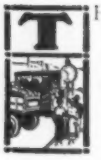
THE OHIO UNIVERSAL TRUCK COMPANY, of Warren, O., has been incorporated with a capital of $200,000.

A. V. WIDMAN has been appointed treasurer and assistant general manager of the Autoparts Manufacturing Company, of Detroit, Mich., which has just moved into a new factory, which gives them 60,000 additional square feet of floor space.

THE WOOD-KNIGHT-HAWK MANUFACTURING COMPANY, of Oklahoma City, Okla., was recently incorporated with a capital of $200,000, the organization including the Pioneer Car Manufacturing Company. Motor plows and the Pioneer car will be manufactured.

European Practice in Lighting Apparatus

BY OUR FOREIGN CORRESPONDENT



THE only lighting systems that, by experience in Europe, have been found to be of any real value for commercial car work (if we except heavy steam wagons and tractors designed for heavy loads at low speed) are acetylene or electrically operated; and though electric lighting plants for this purpose are at present too expensive to tempt the business user, they offer such compensations in the way of low working costs—especially in conjunction with the latest developments in lighting—that it will probably not be long before electric lighting is extensively adopted on commercial cars. But this will only be within limitations, for electric lighting will not do on very rough roads. Still the average road in Germany, France, Great Britain, Holland or Belguim is amply good enough, even with solid rubber tires, which are hardest to light from.

For the purpose of such an article as this, we must consider the lighting question under two headings. The devices by which the light itself may be generated and the means by which that light may be rendered most effective —in other words, the lamps.

In acetylene generators, generally speaking, European practice calls for no special remark. Broadly speaking, either of two systems is used, which may be called respectively, the drip feed and the diving-bell systems, in which the admission of water is regulated by the pressure of the gas it generates.

Special attention, however, may be called to one device used in Europe for separating the used carbide from the unused. This is a grid, which can be shaken at will, so as to act as a sieve, enabling the powder of the used carbide to drop down clear.

With more than one lamp a separate generator is generally regarded as sufficient for all, but there is a good deal to be said for the arrangement made by Messrs. Joseph Lucas, Ltd., of Birmingham, who have a very neat design in which generator and lamp are combined in one, the generating chambers underneath being exceedingly accessible. When a single headlight is carried it certainly renders things more compact, and the elimination of all flexible tubing is a great point, while even where more than one lamp is carried it has merits, for total failure of the light supply is practically impossible with separate generators.

For private car work electric lighting systems have made immense strides during the last twelve months or so, and provided that they can be put on the market at a tempting price, there is every likelihood of their coming to be adopted for commercial cars, even with solid tires, provided the roads are reasonably good; for even if the first cost is higher, the working cost comes out at very much less. At present a complete electric installation with lamps costs about one hundred and fifty dollars, whereas the corresponding acetylene lights (two headlights, two side lamps and tail lamp) cost only about half this figure; but, assuming the cost of operating the latter at eight cents per hour and that the lamps are in use for only six hours per week, even then the electrical system will pay for itself in three years working.

The usual system is to employ a dynamo in conjunction with accumulators, which latter automatically come into action when the engine stops, or rather when it falls below a certain predetermined speed.

Automatic Change-Over

There are various ways of effecting this change-over. It may be done (1) either by a switch operated by a centrifugal type of governor; or, (2) by an electrical cut-out switch acting against an adjustable spring tension; or, (3) purely electrically, by balancing the battery current against that of the dynamo through a solenoid switch, so that when the dynamo current falls below a certain point it ceases to make contact on its circuit, and the accumulaters come into action. Sometimes (4) when the dynamo falls below a certain speed the battery automatically discharges through the dynamo, converting it for the time into a motor. In this case, of course, no switch is necessary. (5) One system, hoewver, introduces a free wheel between the pulley and the armature spindle, so that when the engine speed becomes too slow for the dynamo to charge the accumulators, the accumulators can rotate the armature, which, through the ratchet and pawl mechanism of the free wheel, merely overruns the driving pulley, and thus hardly any current is absorbed for this purpose.

Even when the point at which the change-over from dynamo to accumulator, or *vice versa*, is settled satisfactorily, there is still, however, the great difficulty of variable speed between the lowest and highest of the dynamo.

Several methods are adopted to ensure constant output at these variable speeds. The simplest are: (1) by balancing against the magnets for the main circuit the effect of shunt-wound electro magnets that tend to neturalize the main magnetization—and so the current—in proportion as the speed increases, and (2) using the increased magnetization of the armature as the speed rises, to balance the effect of permanent field magnets.

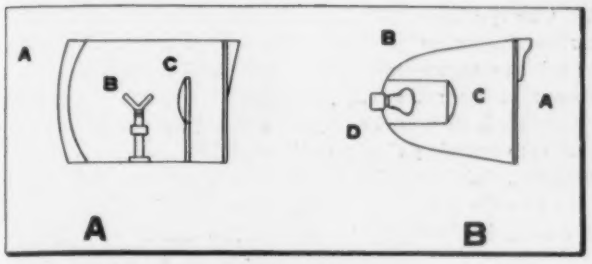


Fig. 1, A. Diagrammatic Sketch of Salusbury Lamp. A, reflector; B, burner; C, lens with front blackened so as to give a "blind spot" to the lamp.
B. Diagram to Represent the Principle of the Silverlyte. A, ordinary flat front glass; B, reflector; C, lens; D, electric lamps that can be adjusted in position horizontally.

The Lamps

As regards the lamps themselves, there are several points that may be interesting, and I have dealt separately with the lamps because some of the ideas contained therein may be equally applicable to acetylene or to electricity.

The result of the lamp trials held by The Royal Automobile Club of Great Britain, some three years ago, went to show that a golden-toned light had decidedly more penetrative quality in fog. Accordingly, several, for example the Autoclipse of Messrs. Brown Brothers, the Solar lamps turned out by Seabrook Brothers, or Smith & Sons' Goldenlyte lamps, are provided with gilt reflectors.

The Silverlyte people, however, as their name implies, make a point of keeping to the silver reflector; but a point about their lamps, as shown in Fig. 1 B, is that they place the lens inside, behind a glass, with the bulb placed behind this lens, so that its distance can be adjusted and correct focus obtained at will.

Vandervell & Company have an electric lamp in which the light is distributed among a series of small electric bulbs arranged around in a ring. For this idea it is claimed that a more intense light is given and that better diffusivity is obtained, while the light is less obstructed.

Something rather the opposite of this is seen in one of the Salusbury acetylene lights, in which a lens blackened in front is placed right in front of the burner, as in sketch Fig. 1 A. The idea of this is to keep down the glare. The lens (*c*) reflects back onto the reflector, and at the same time, since *c* is blackened, it shades the direct glare of the burner.

This question of glaring headlights is one that may cause some trouble in Great Britain, as questions about their suppression have several times been asked in Parliament. It has, however, been on for a long time and many firms have already gone into the matter and produced lamps which, while giving the necessarily bright light, shall not unduly dazzle the eyes of people meeting it.

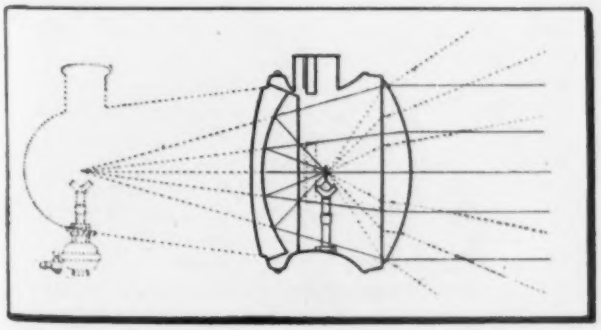


Fig. 2. Autoclipse Lamp, the dotted lines showing how the different rays of light are thrown to the sides.

The well-known French firm of Bleriôt make their front glass in strips laid horizontally, the surfaces of these strips where they join being silvered below and blackened above, so as to reflect the light downwards. The effect is much the same as that of a Venetian blind.

Something of the same principle is evidenced in the Autoclipse lamps of the well-known firm of Brown Brothers, but in these it is the reflecting light that is shut off. The full lines in Fig. 2 will explain the general arrangement of this lamp, which is so arranged as to show a strong light ahead, and also diffuses the light to the sides of the road. The diffused rays which thus emanate direct from the light through the front lens are shown by the dotted lines. The combination of the hyperbolical curved reflector and the plain or convex lens provides the parallel rays shown in full lines, and the figure also incidentally shows, in dotted lines, the length of lamp that would be needed to obtain such rays without the help of the hyperbolic reflector. It is these parallel rays that are dazzling, though they show up the road magnificently, and therefore mechanism is introduced by which a disc can be moved to come between the burner and reflector at will, and thus shut off the powerful parallel rays.

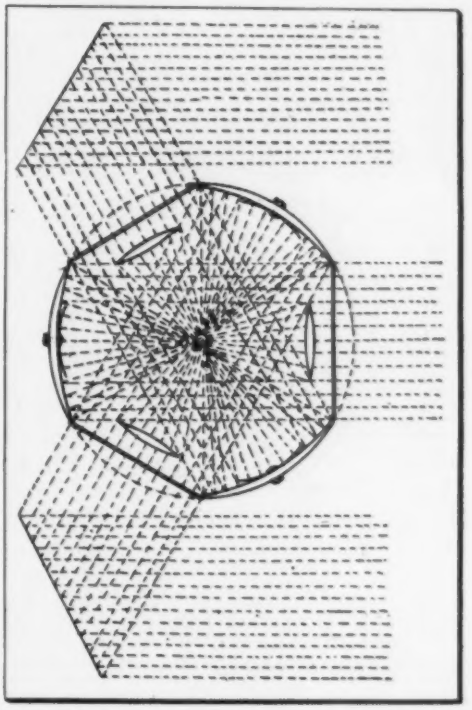


Fig. 3. Effect of three lamps with one, by means of suitably placed side mirrors.

From a constructional point of view the Willocq Botin lamps are worth attention. Spun as they are from a single piece of metal, they avoid all riveting. This form of construction besides being cheap, also certainly reduces cleaning to a minimum.

Effect of Three Lamps With One

One of the most promising systems that the writer has seen is one in which only one headlight is used, the effect of side lights being obtained by mirrors from which the

light of the center lamp is reflected. The principle of this system is shown by the accompanying Fig. 3, which needs but little explanation. The center lamp as at present made is globe-shaped, with lenses so placed on its surface as to reflect onto the side mirrors, the latter being adjustable to obtain the best effect. Such a system ought certainly to be cheap. With a single 16 c.p. lamp it gives a good light

Two Photos Showing the Single Headlight System of Lighting by Mirrors. The lamp is on a hinged frame and can be swung to one side

ahead without dazzling, and the mirrors diffuse the light well to the sides of the road, the one on the left reflecting onto the right side, and *vice versa*. The writer has seen this system at work, and it is certainly effective, for on a dark night, with a 16 c.p. lamp, ordinary typewriting can be read at a distance of one hundred and fifty to two hundred yards.

The Ducellier system will be regarded as typical of the kind in which the subsidiary magnetic field, electrically excited, is opposed to the permanent magnetism of the main magnets, so as to balance against increased speed. The subsidiary field is excited by a shunt circuit, the whole being so designed that the output is practically unvarying between 600 and 1,600 revolutions a minute. The Ducellier dynamo has a unique feature in its amperage regulator whereby the machine can be set to produce approximately the amount of current likely to be required. This regulator consists of a third brush on the armature commutator, mounted so that it can be adjusted a certain number of degrees around the commutator, and when in the position to give off the desired current, it is fixed by a locking ring. The current obtained is at its maximum when the brush is nearly horizontal.

One system—the C A V made by Vandervell and Company—calls for mention on account of its extreme ingenuity. In this one we may say that, as the speed rises, distortion is caused to magnetic fields, so that the current producing magnetism is decreased proportionately as the speed increases. The accompanying diagram will explain matters. N and S are two subsidiary poles, shunt excited, and N1 and S1 are the two main poles. These last are unwound and magnetism is excited in them only by the reaction due to current generated in certain coils of the armature, which are for the moment short-circuited by the commutator brushes. The position of these coils is shown by black dots on the diagram. The commutator brushes are placed in the ordinary position relatively to the main poles, and as the short circuit coils are in the active magnetic field of the subsidiary poles, the short circuit currents thus set up cross magnetize the armature and tend to set up a magnetic flow at right angles to the direct field of the subsidiary poles,—a magnetizing effect which is greatly encouraged by the presence of the main unwound poles. The consequence of this is that the subsidiary magnetic field, instead of traversing right across the armature, is distorted merely to flow quadrantally through the armature, and is deflected so as to return, as seen by the heavier dotted lines. And now another action begins, for all the coils of the armature are now generating working current. This current exercises a magnetizing reaction tending directly to oppose

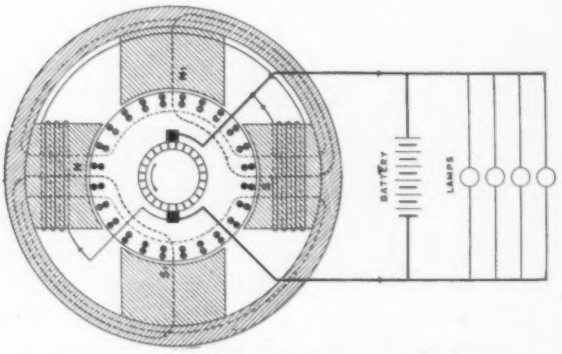


Diagram of C. A. V. Dynamo Action

The C. A. V. Lighting Dynamo, which has several unusual features

the magnetism of the subsidiary poles, reducing the initial magnetic field; and since these demagnetizing reactions increase with the speed, they will counteract any tendency of the E M F to rise as the speed increases.

Little can be said really concerning the use of sound apparatus for drivers of motor cars in Europe. Loud bells used to be used on the London omnibuses, but now, I believe, ordinary motor horns are exclusively employed. This, however, may be due to change of ownership and amalgamation, so as to standardize practice throughout.

In general the ordinary motor horns with rubber bulb find favor, no doubt partly owing to low cost, partly to simplicity, although the rubber bulbs do not last as long as might be desired. With the advent of electric lighting systems, however, and the consequent employment of accumulators, electric horns, in which sound is produced by diaphragms or reeds vibrated electrically, may quite possibly come into extended use, for when you have the accumulators you may as well use them. It is a pity that some makers, to obtain more sound, adopt an eight-volt battery for the horns, for if four volts were made standard practice it would do more than anything else to encourage their use.

But electric horns have occasional uses that few imagine. A friend of the writer's, in driving a small single-cylinder wipe-contact-with-trembler-coil car near Coventry, found the trembler had broken down, and could not be got to work. He accordingly coupled up the vibrator of the horn in circuit, and actually worked back on that, stuffing some cotton waste into the mouth of the horn to keep down the noise as far as possible. Even as it was, however, the car ran her two miles or so back into Coventry to a continuous accompaniment to the weirdest sound imaginable.

Self-Propelled Sprinkling Cart of the City of Berlin

THE ILLUSTRATION shows a sprinkling cart in use by the city of Berlin (which is famous for its clean streets), which has been long enough in use in the "Spree-Athens" to enable one to say that it is designed on proper lines and carried out with such knowledge of the work to be done as to be beyond the experimental stage.

The frame is of the LV type of the Neue Automobil-Gesellschaft, of Berlin, and has a four-cylinder motor of 16-18 h.p. The wheels have solid rubber tires—single in front, double behind. The tank holds five thousand liters, or just two long tons of water—say 1320 United States gallons. The tank and the sprinkling apparatus, which were delivered by the firm of Hermann J. Hellmers, in Hamburg, are of a type which is to be seen in public service in many Continental European cities. While, however, the horse-drawn sprinkling carts which have been in use hitherto are able to spray the water over a width of only four to six meters, or say, thirteen to twenty feet, this one can sprinkle a swath of twenty meters, or sixty-five feet, in breadth. This has the great advantage that one can sprinkle the widest streets clear across at one run, thus interfering less with the regular traffic, and also enabling the work to be done more quickly, even at the same speed of wagon travel.

A Berlin Motor Sprinkling Cart With Individual Spray Controls, which sprinkles the entire width of the street at one run

Water Pressure Constant

One of the conditions set by the municipal authorities of Berlin was that the pressure of the water at the spray nozzles should remain constant, whether the tank was wholly full or nearly empty, a matter that previously had been neglected, but which, however, is of great importance. This condition calls for something new, and this is here present. The water pressure is kept constant, not by the head of the water, but by artificial means. A small independently driven pump is used for this purpose. It is of about 3½ h. p., and is driven by the motor of the cart. There is, on the intermediate shaft between the motor coupling and the change gear, a special coupling for the pump, in constant connection with a gear wheel, which latter meshes with a second one that delivers the power to the pump. The pump and the entire sprinkling apparatus are cared for by one attendant, the driver controlling the movements of the cart as a whole. In order to prevent "water hammer" the tank is divided into three compartments by two cross walls. It is filled in the usual manner, from below, by a hose from the street hydrant. In the upper portion there is a pet-cock for the purpose of enabling the attendant to see when the tank is full. For financial reasons the consumption of water is measured by a special meter on the tank. The width of the street that is sprinkled is determined by the attendant, using a hand-wheel like the steering wheel of the apparatus as a whole. One great advantage of the arrangement chosen is that he can shut off either one of the two inner sprays or either one of the two outer ones at will. The water pressure can be varied, there being three grades: high, medium and low. The entire

arrangement of the spray enables the sprinkling of a strip sixty-five feet wide, or where there are obstructions, as other vehicles, individual sprays can be shut off to avoid these.

Tests made in the presence of the representatives of the municipal authorities of Berlin, Kiel and Hamburg went to show that this cart can sprinkle a length of one and a half kilometers, or say 4920 English feet (0.932 miles), for the full breadth of sixty-five feet. This shows up very favorably for the economy of the device, notwithstanding its heavy first cost, and the fact that it requires not only a driver but a special attendant to manage the spray.

MOTOR TRUCKS SUBSIDIZED

The commercial vehicle in Europe is on a much more advanced basis than it is in America. In the first place, owing to the fact that the governments abroad take a personal interest in the developement of the motor truck, the owners, in order to obtain a subsidy, must operate and maintain the trucks in a way so as to enable them to determine actually and positively the cost of maintenance and operation. Then, again, because of this subsidy arrangement the manufacturers themselves build their trucks under direct supervision of technical representatives from the war departments.

This situation results in a twofold benefit. First, it insures the production of the highest possible grade of motor trucks; second, it enables the general public to know the exact cost of operating and maintaining the same, because under a subsidizing arrangement they are required to make monthly reports to the government, which reports are duly verified by the authorities and known to be correct. When this has been properly done, the government pays one thousand dollars for the initial purchase of the car and two hundred and fifty dollars a year for five years towards the car's maintenance and operation, in exchange for which the truck owners agree to hold the car in readiness to be turned over to the government promptly in case of war; in which case, of course, the unpaid portion of the purchase price is satisfactorily arranged for at that time. This state of affairs produces two very important results; as, as a result of these reports, the government learns the weak points in the construction of commercial vehicles from actual service tests, and these reports in turn enlighten the manufacturer, so that his future product will be immensely strengthened thereby and made to conform with the government regulations, which become more and more rigid as time goes on.

Over in England they have motor vehicles arranged for the transportation of meats from the yards to the butchers' places. The trucks are made so that racks on which the carcasses are hooked are slid into the body of the wagon. The vehicle is refrigerated, so that the only process needed is to run the two racks in and then to close the door. The arrangement hasn't been introduced over here yet, but may be before long.

After sending a representative from Australia to this country to look over the field of American-made cars, the Commonwealth Storage and Supply Company, of Melbourne, has placed an order for twelve Sampson "Thirty-fives."

THE LONDON CAB DIFFICULTY

The event that has absorbed most interest in the commercial car world on the other side of the Atlantic has been trouble in the London cab industry. When the Liberal Government first brought in their tax of three half-pence (three cents) per gallon on gasoline used for commercial car purposes, the drivers would have had to pay it out of their pockets, on the arrangements as they then stood, for the drivers took twenty-five per cent of the profits, but out of that had to supply their own gasoline. The cab companies in general, however, thinking that a tax on the industry was too absurd to last, undertook to pay the tax, although in some cases it is doubtful whether they have not recouped themselves by charging the drivers more for their gasoline. Growing competition has, however, brought to the front a more luxurious type of vehicle and, consequently, the older pioneer companies, which are some of the biggest, finding themselves hard hit and saddled with the gasoline tax, say that unless the men pay the gasoline tax they cannot carry on their business at anything but a loss and will have to shut down.

LARGE CAPACITY TRUCKS ON THE CONTINENT

On the Continent here and there, there is a tendency towards the use of trucks of much larger capacity than have hitherto been in vogue; for instance, the Swiss firm of Berna Motors are supplying six nine-ton lorries of a special type, to the Italian Government, for transporting materials required for fortifications in the Tyrolese Alps. Seeing that these machines have to carry heavy loads up the mountain grades, as steep as one in four in some places, their 50 h.p. engines will not be any too large. Hitherto horses have been used for the work, but as the road contains many sharp corners, it was found that at frequent intervals on the road half of the large teams required were useless. For this reason animal traction caused a good deal of delay

The German firm, the Neue Automobil Gesellschaft, is another that has recently been supplying trucks of exceptional capacity.

A NEW OMNIBUS COMPANY

At the time of writing there are strong rumors of the formation of another powerful motor omnibus company with a capital of five million dollars to enter into competition with the London General Omnibus Company. The enterprise is supposed to emanate from the Birmingham Small Arms and Daimler combined companies; at any rate, the suggested undertaking proposes to use the K. P. L. type of 'bus, already illustrated in these pages.

AUSTRIA'S military budget for 1911, as laid before the delegations in Buda-Pest, embraces estimates for supplying the entire Austrian army with automobiles as a means of transport. Already the system has been made a certainty in certain quarters and it will not be a great while before the entire sixteen army corps of the Austria-Hungary forces will be traveling, whenever occasion demands, in automobiles. This decision was arrived at by the war office at the close of a series of severe and exhaustive tryouts in Vienna and Buda-Pest, the trials having involved the use of automobiles with a carrying capacity of loads weighing from four to eight tons. After a considerable number of tests it was found that loads of this capacity were too heavy, and two-ton trucks were adopted.

Commercial Car Converts

SAMUEL NARDONE, of Westerly, R. I., now owns a commercial car.

HEGNER BROTHERS, grocers, of Oakley, O., have purchased a Buick truck.

FRED J. NEWMAN, of Johnston, R. I., has purchased a 20 h. p. White truck.

F. W. CROSBY, of Billerica, Mass., has purchased a Model H Reo delivery car.

ALDEN L. PALMER, of Portsmouth, N. H., has purchased a 30 h. p. Atlas truck.

THE YASSEN ICE CREAM COMPANY, of Scranton, Pa., now owns an auto truck.

JAMES H. RIDOUT, of Cranson, R. I., has purchased a Royal commercial car.

BENJAMIN F. ALMY, JR., of Johnston, R. I., has an 18 h. p. Reo commercial car.

THE FADDER ICE CREAM COMPANY, of Scranton, Pa., has purchased an auto truck.

THE PIKESVILLE DAIRY COMPANY, of Baltimore, Md., has a three-ton gasoline truck.

JAMES H. WELSH, of Pawtucket, R. I., has invested in a 9 h. p. Reo delivery wagon.

THE RUXTON HEIGHTS MOTOR COMPANY, of Baltimore, Md., now owns a Mack truck.

FRANKLIN E. BROWN, of Tiverton, R. I., has purchased a 23 h. p. Overland delivery car.

THE MONUMENTAL BREWING COMPANY, of Baltimore, Md., now owns a three-ton truck.

THE BARTON COMPANY, of Manchester, N. H., has purchased a Hudson commercial car.

THE CITY BAKING COMPANY, of Baltimore, Md., is a recent purchaser of a Mack truck.

KENNARD & COMPANY, of Wilmington, Del., have purchased a Sampson delivery truck.

THE JOHN M. DEAN COMPANY, of Providence, R. I., now owns a 9 h. p. Reo delivery wagon.

THE BARRETT MANUFACTURING COMPANY, of Boston, Mass., has purchased an Atlas truck.

WILLIAM F. NICKERSON, of Provincetown, Mass., has purchased a 28 h. p. commercial car.

THE J. F. WIESSNER BREWING COMPANY, of Baltimore, Md., has purchased two Mack trucks.

THE DOLBEY ICE CREAM COMPANY, of Providence, R. I., has purchased a 9 h. p. Reo express wagon.

THE GEORGE A. WEAVER COMPANY, of Newport, R. I., has purchased a 20 h. p. commercial car.

THE PROVIDENCE ICE COMPANY, of Providenece, R. I., has purchased a 16 h. p. Buick express wagon.

THE WORCESTER BREWERY CORPORATION, of Worcester, Mass., has purchased a three-ton Knox truck.

THE A. G. WALTON COMPANY, of New Bedford, Mass., has purchased a five-ton General Vehicle truck.

THE GALLER-WARD AND HASNER HARDWARE COMPANY, of St. Louis, Mo., has installed two Gramm trucks.

THE OLD COLONY EXPRESS, of Providence, R. I., has become possessed of a 36 h. p. Gramm-Logan truck.

THE GRANADA TRANSFER COMPANY, of Oakley, O., has become possessed of a two-ton Grabowsky truck.

H. MIDWOOD & SONS COMPANY, of Providence, R. I., has purchased a 10 h. p. Cadillac delivery wagon.

MAURY-DORE, of Washington, D. C., has placed an order for a Mack truck to be fitted with a dumping body.

J. ALBERT BRODRIB, a florist of Hartford, Conn., has added a Pope-Hartford delivery wagon to his equipment.

THE BAILEY EXPRESS COMPANY, of Saugus, Mass., is now owner of a three-ton Johnson commercial car.

THE LYONS DELANEY COMPANY, Inc., of Pawtucket, R. I., is now using a 32 h. p. truck.

THOMAS L. TAYLOR, of Cranson, R. I., has installed a Ford 23 h. p. delivery car.

THE SEEGER REFRIGERATOR COMPANY, of St. Paul, Minn., recently bought a Stegeman truck.

THE GRIMM MILLING COMPANY, of Huntington, W. Va., has added a commercial car to its delivery service.

THE EMMONS-HAWKINS HARDWARE COMPANY, of Huntington, W. Va., has purchased a commercial car.

CHAFFEE BROTHERS COMPANY, of Worcester, Mass., have a new 16 h. p. Atlas commercial car.

THE CROWN CORK AND SEAL COMPANY, of Baltimore, Md., has in use a three-ton Grabowsky truck.

THE RUDOLPH STECHER BREWERY, of Murphysboro, Ill., is now delivering beer via commercial car.

SEVERINO P. MELLO, of New Bedford, Mass., is now the owner of a 25 h. p. Locomobile for delivery purposes.

THE LONTTIT HOME LAUNDRY COMPANY, of Providence, R. I., has purchased two 10 h. p. Cadillac delivery wagons.

THE WEST VIRGINIA BREWING COMPANY, of Huntington, W.Va., has purchased a commercial car of high power.

DAVID LACABANNO, a freight drayman, of San Francisco, Cal., has acquired an Autocar truck for use in his business.

JOSEPH QUIRIN, of Manchester, N. H., has secured a fifteen hundred pound Rambler truck for use in his business.

J. P. LYONS, of Ashtabula, Ohio, has purchased a commercial car for use in his livery and transfer business.

THE PALAIS ROYAL, of Washington, D. C., has purchased a White light delivery truck from the Imperial Motor Company.

LOS ANGELES COUNTY, CAL., has purchased a Franklin one-ton truck for use in repairing its roads. The price was $2550.

A "LITTLE GIANT" TRUCK has been delivered to J. W. Hennion, of Paterson, N. J., for use in his delivery department.

THE BINYON TRANSFER AND STORAGE COMPANY, of Fort Worth, Tex., has purchased a truck to be used in the business.

THE BURR CREAMERY COMPANY, of Los Angeles, Cal., is using a Sampson one-ton commercial car for delivery purposes.

HARDRICK BROTHERS, of Springfield, Mass., now have a Sampson commercial car of fifteen hundred pounds capacity.

THE COCO-COLA COMPANY, of Scranton and Wilkes-Barre, Pa., has disposed of its horses and purchased Chase trucks in their stead.

THE SCHMULBACH BREWING COMPANY, of Wheeling, W. Va., has installed a new commercial car for use in its delivery department.

JOHN P. CURLEY, a farmer near Lowell, Mass., finds that he can save money by using a Buick delivery car to get his produce to market.

J. J. THOMPSON, of St. Albans, Vt., has purchased a 22 h.p. commercial car, and is using it in delivering between his liquor store and warehouse.

E. W. PHILO, the greatest poultry authority of the country, has just purchased a Reo auto delivery truck of the LaFrance Motor Car Company.

KLEBER'S BAKERY, of Dallas, Tex., has purchased a Sampson truck and has placed an order for another to be used to deliver bakery products.

THE BROADWAY DEPARTMENT STORE, of Los Angeles, Cal., has installed a one and one-half-ton truck to attend to its suburban delivery around Pasadena and Alhambra.

JOHN A. SCOTT & COMPANY, of Toledo, O., have purchased an Adams one-ton truck which will dispense with the two horse drawn trucks they have been using.

THE ROCKINGHAM COUNTY LIGHT AND POWER COMPANY, of Portsmouth, N. H., will shortly install a commercial car to be used in the coustruction department of the company.

WALDING, KINNAN AND MARVIN COMPANY, wholesale druggists of Toledo, O., have purchased a Gramm Motor Truck. The capacity is five tons and the speed is 12 m. p. h.

JACOB RUPERT, the New York brewer, has recently placed an order with the General Vehicle Company for thirteen five-ton trucks, which makes nineteen trucks the firm now has in use.

A. HENGARTNER, an ice cream manufacturer of Lorain, Ohio, has acquired a Reo commercial car. The truck has been tried out and found satisfactory, and will be used to deliver ice cream.

THE W. E. TILLOTSON MFG. CO., of Pittsfield, Mass., has purchased a 3-ton American Locomtive Company's auto truck of the same design as that used in New York by the American Express Company.

THE COUNTY COURT of Jackson county, Mo., has purchased two big Seitz trucks as a measure of economy. The two machines will take the place of eight men and as many teams.

THE BUCKNER'S orphan home has purchased a Sampson truck which will be used for delivery of provisions, etc., to and from the orphanage at Orphan's Home, Tex., also to their branch in Dallas.

H. S. HERBERT & COMPANY, coal dealers, of New York City, has purchased a Commer truck. The firm intends to gradually replace its horse drawn equipment with a battery of Commer trucks.

CROOK, RECORD & COMPANY, of Paris, Tex., have put in a large Cadillac delivery motor. Like many of the department stores, they find the motor trucks superior to the old regime of the horse.

A BRAZOS & SONS, of Middletown, Conn., have bought an Alco commercial car from the American locomotive Company. It has a capacity of three tons and will be used in the furniture business.

RECENT PURCHASERS of Decatur trucks are: Henry Siegel, Thomas F. Garrison, of Boston, Mass.; Taft and Mitchell, of Newton, Mass.; W. A. Curier, of Lawrence, Mass.; Fred D. Johnson, Concord, N. H.

H. J. CROSS, of Augusta, Me., had his Pope-Toledo car remodelled into a commercial car for use in his delivery business. A body 8 x 4 ft. has been built on to the car and extra heavy chains have been added.

THE MORRISON MUSIC COMPANY, of Cumberland, Md., has received its new White motor truck which was ordered some time ago. The machine is the first of its kind in the city and is attracting great interest.

THE PEARSON-PAGE COMPANY, of Portland, Ore., has purchased two Buick light delivery trucks with flat-deck bodies. This firm has successfully operated for the past year a Buick light delivery truck with an express body.

THE RAPID GROWTH of the motor truck business in Kansas City, Mo., is indicated by the business of the Rapid-Reliance branch here. During the last two months this concern has averaged one truck sale a day. —W. D. M.

THE ROBINSON FURNITURE COMPANY, of Sharon, Pa., has purchased a 25 h. p. Chase commercial car which will soon be placed in service. The truck has a capacity of one ton and can attain a speed of 25 miles per hour.

THE MONROE STREET FISH MARKET, of Grand Rapids, Mich., has been compelled to add an auto delivery to its service. This will enable the market to deliver fish to its customers within a few hours from the time they are caught.

A PEERLEES five-ton truck has been selected by the B. T. Babbitt Company as the best type of vehicle for hauling merchandise from the works at Babbitt, N. J., to a Manhattan pier. The bulk of the loads which the Peerless will carry formerly went by lighter.

A ONE-TON ELECTRIC AUTO TRUCK has been delivered to the Lehigh Valley Transit Company, for use in heavy hauling of supplies around Allentown, Pa. The car is one of four that have been ordered, a second to be shipped soon. Some of the trucks will be of larger capacity.

THE FOLLOWING San Francisco, Cal., firms have installed Cartercar trucks: Hale Brothers, F. Suhr Company, funeral directors; F. Conner, Metropolitan Laundry; D. Cohen, cleaning and dyeing; H. M. Nolter, meats; Schloss Crockery Company, and Lee & VanWinkle, teas and coffees.

THE INTERSTATE CEMETERY COMPANY, owner of the Lawncroft Cemetery, which is about seven miles from Wilmington, Del., has placed on service a handsome and commodious funeral car in order to save time and lessen the expense of handling funerals from Wilmington to Chester.

A Tire for Every Purpose

EVERY TYPE of commercial motor car, whether gasolene, electric or steam—Every capacity from light delivery to five-ton truck—Every degree of speed and road condition—In fact, every need and circumstance affecting tire service is exactly met by one of the various types of

"Firestone"

SIDE-WIRE TIRES

The World's Standard

Furnished on regular channel or flange rims. Also on Firestone Quick Removable Rims for quick tire-changing right on the spot—over two years in successful use.

Every Delivery Problem Can Have the Benefit of Firestone Quality

The experience we have gained in equipping most of the commercial cars now in operation, is at the disposal of your own tire problems. Write us for information.

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"America's Largest Exclusive Tire and Rim Makers"

ATLANTA, 58 Auburn Ave.
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DALLAS, 1415 Commerce St.
DENVER, 28 West Colfax Ave.
DETROIT, 240-2 Jefferson Ave.
JACKSONVILLE, 12 East Adams St.
KANSAS CITY, 1737 Grand Ave.
LOS ANGELES, 1239 South Olive St.
LOUISVILLE, 928-30 South Third St.
MEMPHIS, 68 South Second St.
MILWAUKEE, 568 Market St.
MINNEAPOLIS, 311 South Fifth St.
NEW ORLEANS, 613-15 Baronne St.
NEW YORK, 1871-75 Broadway.
OKLAHOMA CITY, 416 North Broadway
OMAHA, 2127 Farnam St.
PHILADELPHIA, 256 North Broad St.
PITTSBURG, 5904 Penn Ave.
PORTLAND, ORE., 510 Alder St.
ST. LOUIS, Cor. 23d and Olive Sts.
SALT LAKE CITY, 147-49 South State St.
SAN FRANCISCO, Cor. Van Ness Ave. and Fulton St.
SAVANNAH, Cor. Perry and Drayton Sts.
SEATTLE, 918 East Pike St.
SYRACUSE, Hanover Square.
TOLEDO, 241-243 Erie St.
WASHINGTON, 1736 14th St., N. W.
WICHITA, 227-229 South Lawrence Ave.
MEXICO CITY, la Ave., Juarez No. 88.

100 sales and applying stations give you best and quickest service

Parsons' White Brass
IN
Packard Trucks

The truck shown above, owned by John Wanamaker, Philadelphia, has our metal in the engine bearings, running day and night. Its durability has astonished the Wanamaker people, who will testify to its value to them. Other reliable houses in Philadelphia use it in their trucks.

"Ask the man who uses it"

The Old and Reliable House of Butterworth, Established 1820, Says:

Wm. Cramp & Sons,
Philadelphia, Pa.

Philadelphia, May 10, 1911.

Gentlemen:

In addition to the bronze and brass castings that we purchase from you, and which we have found uniformly satisfactory, we are pleased to learn from you to-day that the Packard Truck, which we have had in use for over a year, is fitted with PARSONS' WHITE BRASS in the bearings of the motor. We are not surprised, therefore, that the working of the engine of this truck has been entirely satisfactory. The bearings have not been removed since the truck was first bought, and little or no adjustment has been necessary.

Trusting this information will be of interest to you, we are, Yours truly,

H. W. Butterworth & Sons Co.
J. Warner Butterworth, Sec'y.

WM. CRAMP & SONS SHIP & ENGINE BUILDING COMPANY
PHILADELPHIA, PENNSYLVANIA, U. S. A.

Wheel for Heavy Motor Truck

The Schwarz Wheel

has become recognized as the standard of quality. The question usually asked of a wheel maker by a wheel buyer is: "How do your wheels compare with the Schwarz?"

There is no secret about the success of our wheels, for we use the best of selected stock and our construction insures greatest strength.

Schwarz Patent Spokes

Spokes at the tenon are grooved and mortised and interlock, forming an absolutely compact, immovable assemblage, which cannot loosen under the most severe strain. The only wheel with positive and evenly distributed spoke support. Can be made and shipped complete without hub.

We were pioneers in the manufacture of the heavy truck wheel, and have made of it a careful study. We maintain a special, fully equipped department for this work, and are prepared to design and proportion wheels in proper keeping with the other features of construction. Our engineers are at your disposal.

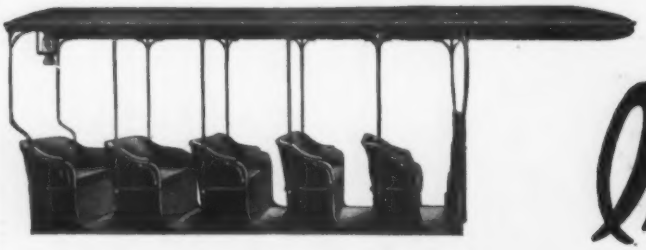
All the leading manufacturers of Motor Trucks use the **Schwarz Wheel**—strong evidence of its superiority. It is the only wheel which will stand up continuously under heavy stress.

Send for Illustrated Booklet

Don't hesitate to write us for fear our prices are too high. We sell wheels as cheap as you can buy satisfaction.

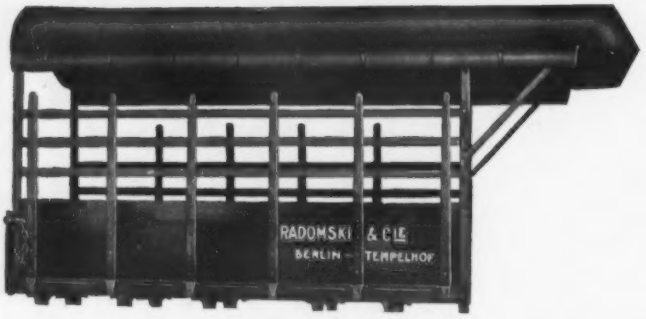
The Schwarz Wheel Company

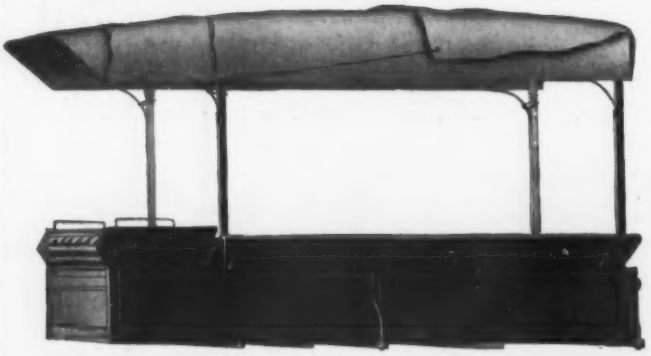
Frankford, Philadelphia



McIntyre

Commercial Power Wagons





Special bodies for every purpose.

Dealers handling the McIntyre line are the leading dealers in their communities:

Because—

The McIntyre line is complete.

The price is right.

One sale produces other sales.

It is built on honor.

The Heavy Duty Motor has an automatic governor, which absolutely prevents overspeeding—the source of 90% of all truck troubles.

The owner, not the driver, controls the speed.

It is built for service.

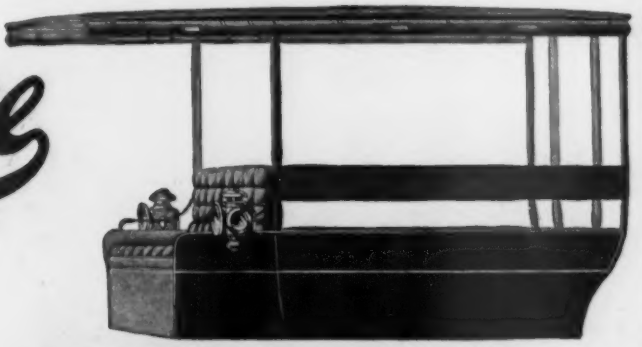
The McIntyre advertising campaign in the newspapers promotes business for the dealers.

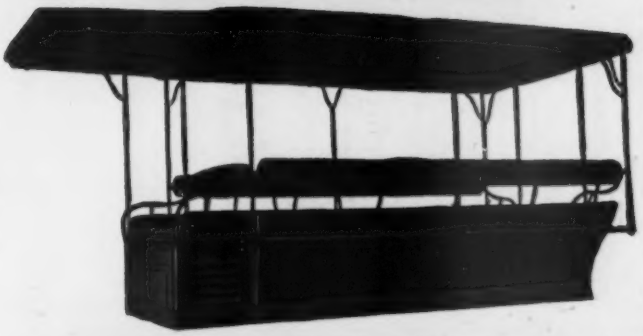
The McIntyre advertising campaign is the greatest newspaper publicity campaign ever applied to the exploitation of a commercial power wagon.

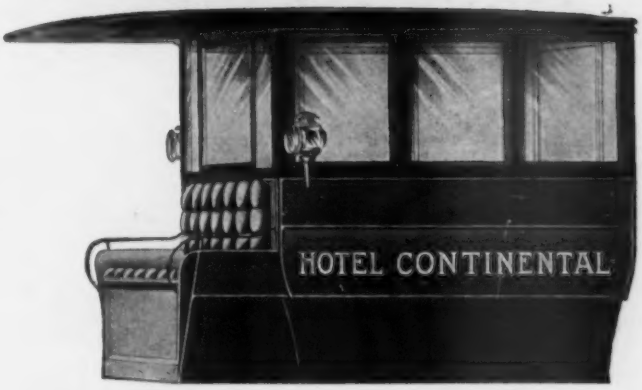
W. H. McIntyre Co.
AUBURN INDIANA

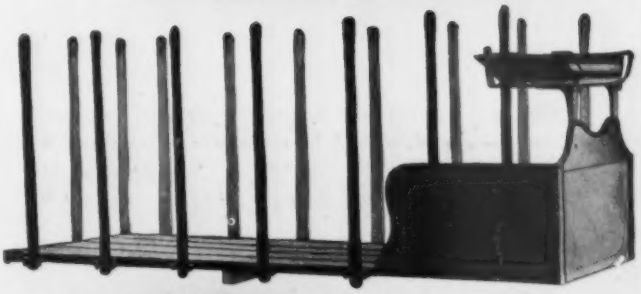
McIntyre

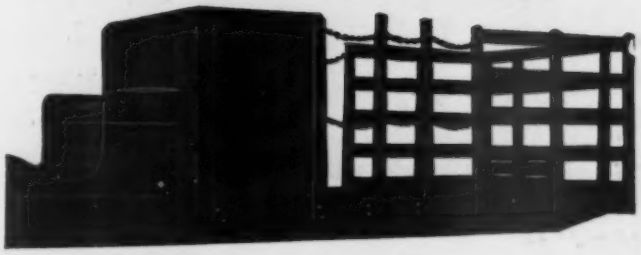
Commercial Power Wagons











have proven their adaptability to every commercial need. They are making good everywhere, and quality and price considered they are absolutely without a rival.

Note these specifications:

Model "XIV"—Guaranteed capacity 2000 lbs.

Tires: 2½", solid rubber, or at an expense of $50.00 extra, 3" in front and 3½" in the rear.

Motor: 24 H.P., two-cylinder, bore 5¼".

Stroke: 4¾". Water-cooled.

Transmission: Planetary, or at an extra charge of $150.00, sliding gear with three speeds forward and one reverse.

Ignition: Dual system, Magneto and Dry cells.

Price of Chassis, $1300

Model "XXI"—Guaranteed capacity 3000 lbs.

Tires: 3" solid rubber in front, 3½" in the rear.

Motor: 35 H. P., 4 cylinders, water-cooled, 4¼" bore, 4½" stroke.

Transmission: Planetary, or at an expense of $150.00, sliding gear with three speeds forward and one reverse.

Ignition: Dual system, Magneto and Dry cells.

Price of Chassis, $1600

We can furnish any kind of body required at lowest prices.

Send for particulars regarding the complete McIntyre line; also for information regarding our newspaper campaign conducted over the dealer's own name in the dealer's own city.

W. H. McIntyre Co.

AUBURN INDIANA

Note that we started to go "Faster than Freight." We were too conservative. We really went faster than express.

Commer Trucking *vs.* Express

IT is a fact that in many cases the sturdy Commer Truck can deliver goods from one city to another more quickly and with less cost than by Express. Please read this absolute proof.

On the night of April 6th John Wanamaker's New York store put a 4-ton load on the above 4½-ton Commer Truck. The load included a piano, furniture, marble slabs and general merchandise.

At 3.55 a.m. on the morning of April 7th this Commer Truck left the Wyckoff, Church & Partridge New York City Building carrying the 4-ton load and six men. Without strained effort or stunt driving it went from our headquarters in New York to John Wanamaker's, Philadelphia, in 7 hours and 35 minutes—this time including ferry delays of 35 minutes.

After unloading at Philadelphia, another load of over three tons was put on the truck for the return trip. The six men also returned on the truck. The return trip was made in just seven hours. Now here comes the almost unbelievable part. The cost of that entire trip was:

Driver ($20.00 a week)—Day's work plus 5 hours at time and one-half extra	$6.16
40 Gallons gasoline at 11c. per gallon	4.40
Three pints lubricating oil	.20
Grease	.20
Maintenance 4c. a mile (based on maintenance contract)	8.80
Tires 7c. a mile (based on manufacturer's guarantee)	15.40
Insurance at 50c. per day (approx. $150 per annum)	.50
Depreciation 3c. a mile (based on proved records)	6.60
	$42.26

Distance covered was 220 miles. Approximate cost per mile was 16.8c. Average running time 15¾ miles per hour. No adjustments were needed en route. There were no scratches on the Polack Tires, although the Truck had to go over a good bit of crushed stone at various parts of the run.

These loads to and from Philadelphia would have cost nearly twice as much by Express.

The time necessary to express, together with time of unloading and carting to and from trains to the stores, would have been considerably more than the time the Commer Truck took. So the Commer was quicker than express would have been.

Please remember this was no stunt run. That same Truck did over 800 miles of continuous demonstration service during the week of the run.

The run simply confirms the faith we have in the Commer Truck—a faith founded on two years of expert investigation of motor-trucks both here and abroad, and proved records of economy, together with the fact that not one of the many seven-year-old Commer Trucks has worn out. We knew after that investigation that the Commer was the world's best high-duty motor-truck.

We can prove to your absolute satisfaction that the Commer is the truck for you. We will do this by actual demonstration. There will be no empty promises or general talk. We want you to try the Commer on your special trucking problems, for comparative tests have sold more Commer Trucks than our advertising or personal salesmanship ever will.

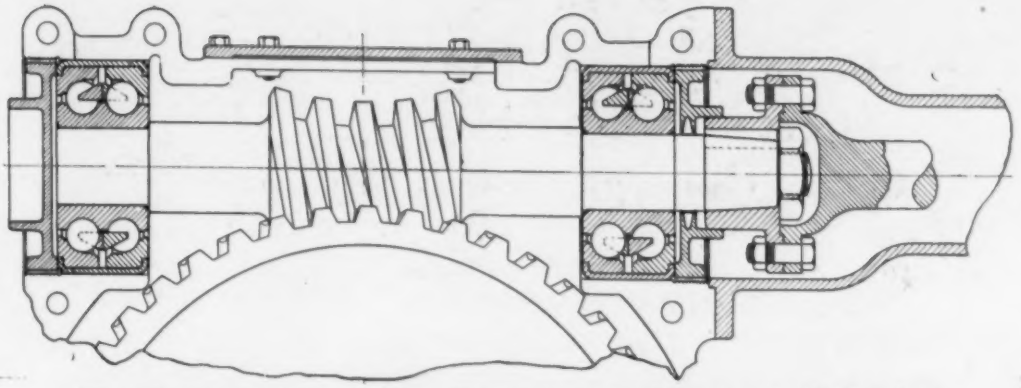
Write our department B for particulars and the name of our nearest agent.

WYCKOFF, CHURCH & PARTRIDGE, INC

BROADWAY AT 56TH STREET, NEW YORK **The Most Complete Motor Service in America**

We shall be pleased to negotiate for the Commer Truck agency with dealers in other large cities

NEW DEPARTURE
Ball Bearings



Simple mounting of New Departure double row ball bearing in worm drive mechanism.

The Logical Bearing for Worm Gears

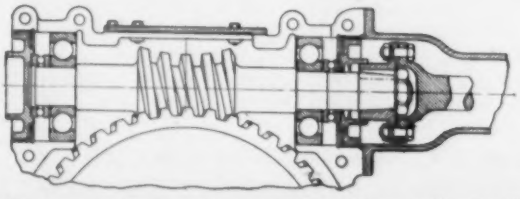
The New Departure double row ball bearing is particularly well adapted for efficiency in worm gear mechanism. Here, the thrust loads are unusually severe, often equaling the radial strains. The New Departure bearing resists both the radial and thrust stresses simultaneously, if necessary, and without friction.

It maintains the absolute alignment that is essential.

Besides being superior in efficiency, it is also economically mounted because of the few parts to assemble, the minimum machining necessary and no possibility of error in installing.

This bearing cares for the severe service conditions in worm gear mechanism even more effectually than will any combination of single row and thrust bearings and offers, besides, other important advantages. Note the comparative mountings illustrated on this page.

You can have our descriptive catalogue and the co-operative service of our engineering department, for the asking.



Complicated mounting of combination of single row and thrust ball bearings in worm gear mechanism.

The New Departure Mfg. Co., Bristol, Conn.

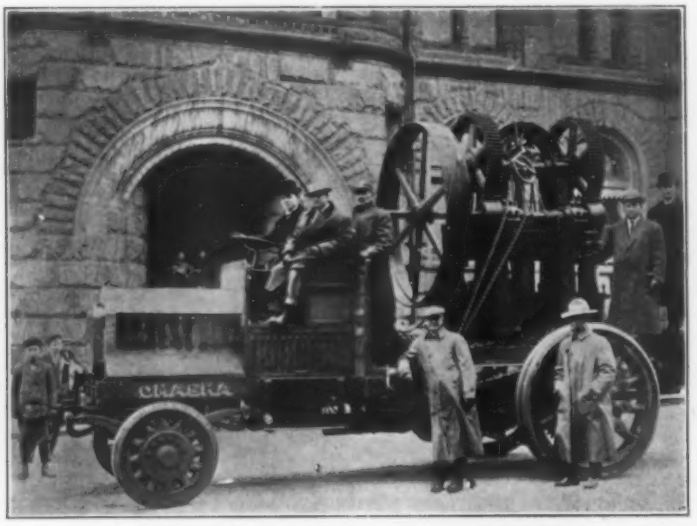
Western Branch Office, Room 1016-17 Ford Bldg., Detroit

UNITED STATES SOLID MOTOR TIRES

HARTFORD
MORGAN & WRIGHT

ARE THE TOUGHEST TRUCK TIRES IN THE WORLD

Into them is put the combined strength and wearing qualities of two world-famous makes—HARTFORD and MORGAN & WRIGHT



UNITED STATES SOLID MOTOR TIRES
Hartford Brand
36" x 4" Single 60" x 4" Dual

The owners of this giant "Omaska" truck say—"This truck was backed up over an 18" curb several times without any apparent injury to its Hartford Tires."

Consider that the dead weight of the truck alone is ***8 tons,*** and its combined haul-and-carry capacity ***34 tons.*** Can you imagine any "ordinary" truck tire able to "stand the racket" like these UNITED STATES TIRES?

UNITED STATES SOLID MOTOR TIRES are ***not ordinary*** tires. The exceptionally favorable conditions under which they are built guarantee extraordinary durability and wear-resisting qualities.

Equip your trucks with UNITED STATES TIRES. They insure to your delivery department continuous efficient service, with fewest renewals and repairs, and with consequently the least loss of time. These are the items that determine the profit or loss on your Motor Truck system.

Our complete Motor Truck Tire Catalog is now ready. Send for it today.

UNITED STATES TIRE COMPANY

Broadway at 58th Street, New York

Branches in all large cities

Overland

Why Uncle Sam Uses this make of Delivery Car

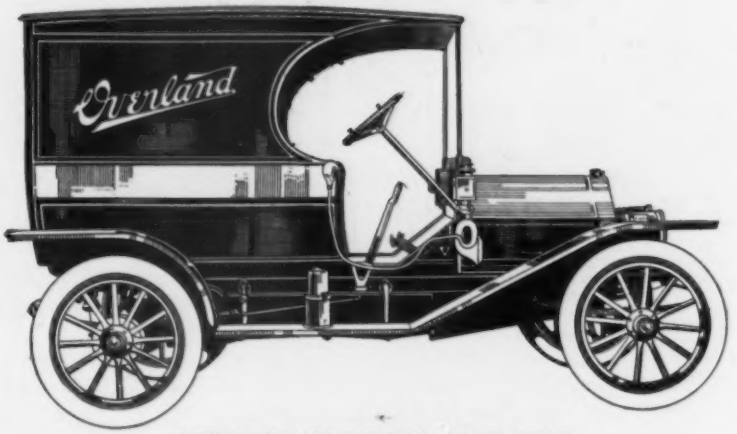
When Uncle Sam adopts the use of any specific product, piece of machinery or thing, it is reasonable to suppose that it ranks with the best. The Government, in every one of its departments, employs men to carefully look over the market, examine, test, etc., everything before it purchases.

Therefore, when Overland Light Delivery Wagons were purchased over two years ago for use in the mail service in Indianapolis, this investigation of course took place. Overland Delivery Wagons consequently were not bought by the Government until a careful elimination of all other models had taken place.

In order to make sure that Overland Delivery Wagons were the best, Uncle Sam conducted a Mail Wagon Contest in Philadelphia. The Overland won "hands down," and is still "holding the fort."

If you are looking for a Light Delivery Wagon, something that will carry in the neighborhood of 800 lbs., you can't do better than buy an Overland. Uncle Sam thinks so and there are also hundreds of Store Keepers and others who think the same thing.

We want to tell you the facts, to show you the cars, to demonstrate what you can do with them. Send for our Commercial Vehicle Book to-day. Ask for Booklet N-46, then you will be sure to get the right one.



OVERLAND LIGHT DELIVERY WAGON

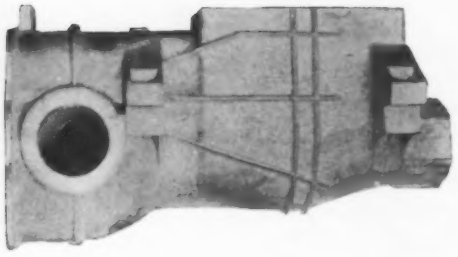
Horse Power, 25; Wheel Base, 102 inches. Made with the Closed and Open Express Bodies.

THE WILLYS-OVERLAND CO., Toledo, Ohio

AUTOMOBILE BRAND CASTINGS

Get Good Bearings

Good bearings carry weight with little fuel expense.



AUTOMOBILE BRAND

PLASTIC BRONZE for general bearings.
PHOSPHOR BRONZE for hardened and ground shaft.
DIE CASTINGS when the compression strain is not excessive.

The practical buyer will figure what it costs to carry each pound of dead weight a year; this is constant load and more important than capacity load, as it catches you going and coming.

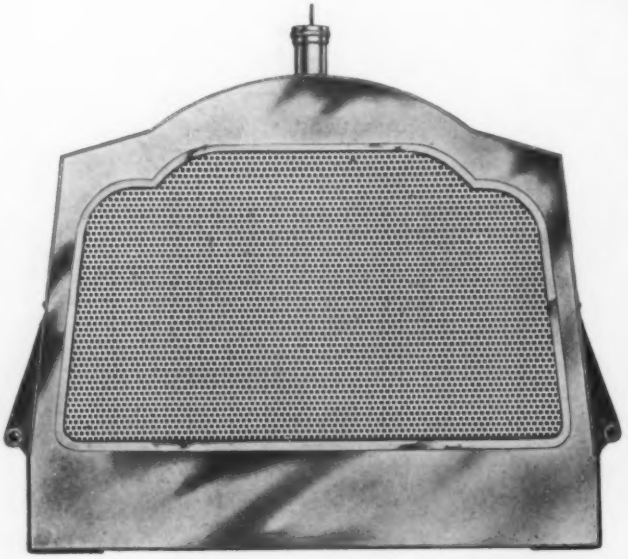
AUTOMOBILE BRAND

ALUMINUM castings weigh only one-third as much as Red Brass, are about as strong, and better suited for many purposes.

MANGANESE BRONZE is a good substitute for drop forgings when the quantity will not warrant the cost of dies, and when prompt deliveries are a factor.

LIGHT MANUFACTURING & FOUNDRY CO., POTTSTOWN, PA.

VITALLY IMPORTANT



to the success of a motor truck is the RADIATOR,—this fact is universally recognized —no other part deserves the same consideration.

We manufacture radiators for nearly every manufacturer of high-grade automobiles. If you will write us, we can give you a list of the most successful automobile makers in America,—all of whom use

FEDDERS RADIATORS

What does this prove to you?

FIRST—that we have the most satisfactory radiator: SECOND—that we have the facilities for manufacturing in quantities, so that we can DELIVER ON DATES PROMISED.

Commercial Cars require radiators that will withstand all sorts of wear and tear and severe road shocks,—it is this fact that prompts the leading makers of trucks to use FEDDERS RADIATORS.

Our new catalog contains a world of valuable information for those afflicted with Radiator troubles,—you're sure to find a remedy somewhere in its pages.

MAY WE SEND IT?

FEDDERS MANUFACTURING WORKS, BUFFALO, NEW YORK

MOTOR TRUCK BANDS

FOR

SINGLE OR DUAL TIRES

MATERIAL—We are putting into the construction of our bands the very best material obtainable.

WORKMANSHIP—Our men have become proficient in this line of work through experience gained in the growth of our motor truck band business.

PRICE—The process of electric welding together with the volume of work done in this department assures satisfactory prices.

DELIVERY—An unexcelled equipment for the handling of this trade and recent additions to our factory enable us to give good deliveries.

We solicit your orders along the lines above mentioned

THE STANDARD WELDING CO.

Western Representative,
L. F. McCLERNAN,
1243 Peoples Gas Bldg., CHICAGO
1417 Ford Bldg., DETROIT

ELECTRIC WELDING PIONEERS

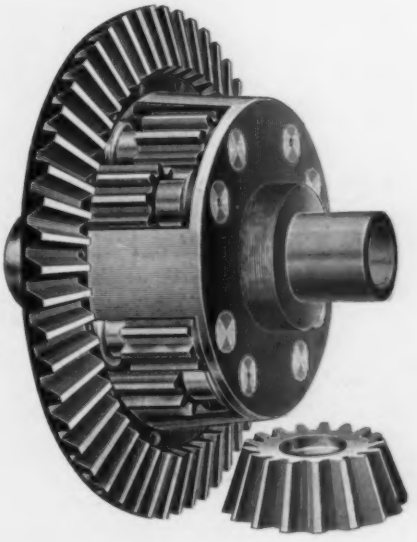
CLEVELAND

Eastern Representative,
L. D. ROCKWELL,
United States Express Bldg., NEW YORK

CULLMAN SPROCKETS and Differentials

in stock and to order.

Send for catalog and let us quote you on your requirements.



CULLMAN WHEEL COMPANY, CHICAGO

1351 GREENWOOD TERRACE

MODEL B. CAPACITY 750 LBS.

You wouldn't pick a light man for heavy work

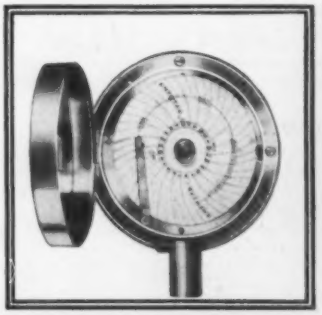
Mere "classy" appearance does not count in the daily grind to which commercial cars are subjected. You must go deeper than this. **Good pleasure car practice is not necessarily good for trucks and deliveries.**

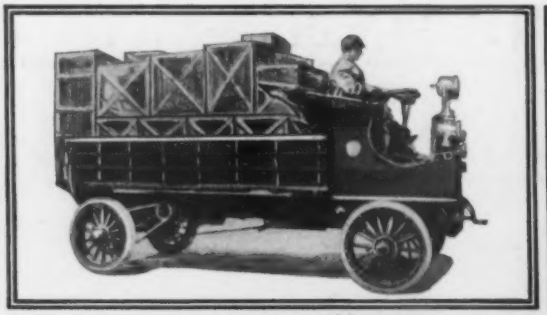
We don't build them as a side line,—it's our life work. American trucks, 2, 3 and 5 ton, have been in successful use for seven years. The Ewing Light Delivery, new models, are the result of the best commercial car practice and experiment.

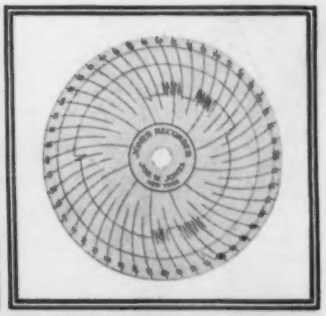
The combined line offers an unusual opportunity for reputable Dealers in territory where we are not now represented.

Literature and particulars on request.

FINDLAY MOTOR CO. Dept. 9 Findlay, Ohio







THE CLOCK | **THE TRUCK** | **THE RECORD**

This Device Saves Money For You

The Jones Recorder is an enclosed eight-day clock, in handsomely finished heavy brass case with flexible shaft connecting with gears on the front of wheel exactly the same as a speedometer. This shaft operates the chart and recording marker in the brass case.

The truck is your commercial vehicle. It is sent on a trip. You have no means of knowing whether it is working ALL the time—you do not know whether the driver is loafing or whether he is attending to his business—your business. He may be in a bar-room when he SHOULD be delivering merchandise or operating your truck.

The chart in the Jones Recorder tells you just when your truck is in motion—when it stops—how long it stops—how far it runs and at what speed and whether the driver reports stops he hasn't made at all. You know whether he makes deliveries quickly or takes unnecessary time. The record is made by a marker on the chart, the brass case is locked and YOU or your authorized representative carries the key—it is tamper-proof. Charts changed daily.

Write for illustrated folder—gives full particulars

THE JONES SPEEDOMETER, 250 W. 54th STREET, NEW YORK

CHICAGO: 1430 Michigan Ave. BOSTON: 109 Massachusetts Ave. PHILADELPHIA: 1406 Vine St.

AUTOBESTINE

BEST BRAKE LINING

WOVEN STEEL HOSE & RUBBER CO.

TRENTON N.J.

FOR PRICES AND FULL PARTICULARS
WRITE TO THE SOLE MANUFACTURERS

WOVEN STEEL HOSE & RUBBER CO.
TRENTON, N. J.

NATIONAL SALES CORPORATION, Factory Sales Manager
250 W. 54th Street, New York
DETROIT: 874 Woodward Ave. CHICAGO: 1436 Michigan Ave.

Red Head
TRADE MARK
SPARK PLUG

To make sure that big spark plug expense does not prevent you from winning the Commercial Car Journal's Economy Contest—be sure to use RED HEAD Spark Plugs.

It's the RED HEAD that provides maximum efficiency at the lowest safe limit of cost.

It's the RED HEAD that has the porcelain that "laughs at the heat."

It's the RED HEAD that is used by leading motor truck manufacturers as standard equipment.

And it's RED RIB Ignition Wire that carries the "juice" under all conditions.

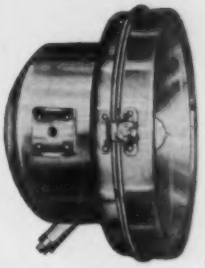
RED HEAD—$1.00 for all sizes.
RED RIB—Primary 5c; Secondary, 12c. Magneto 10c, per foot.
Rubber or Braided.

EMIL GROSSMAN CO., Manuf'r
250 W. 54th St., New York
BRANCHES: 1436 Michigan Ave., Chicago; 874 Woodward Ave., Detroit

TRADE K-W MARK

Electric Road Lighting Outfit

"The Successor to The Gas Tank"



Current Direct from Magneto

THE K-W ROAD LIGHTING OUTFIT—Magneto, pair of Head Lamps, Switch, Wire and Bulbs, all complete for $50.00

The Simplest Electric Light Outfit in the World

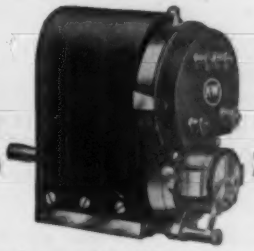
Perfectly Reliable at All Times

NO Storage Battery to Sulphate or Short Circuit.
Commutator or Brushes to Make Trouble.
Complicated Cut-out to go wrong.
Delicate Ammeter or Voltmeter to lie to you.
Complicated Electrical Connections.
And the PRICE is right.

K-W belt or friction drive Magnetos run the lights at night and can be switched off in the day-time or used for ignition with coil and timer. High Tension Magnetos do not run electric lights.

The K-W High Tension Magneto

Model J Guaranteed to Start Auto Engines up to 30 H. P.



No Coil
No Timer
No Batteries
2 & 4 Cyl., $50
6 Cyl., $55

Extremely simple—nearly half less parts than any other Magneto. Perfectly reliable.

We make larger Magnetos for larger engines.

If you cannot gear drive a High Tension Magneto use one of our $35.00 Low Tension belt or friction drive Magnetos, and a K-W Spark Coil.

Write for Catalogue 16

THE K-W IGNITION Co.
41 POWER AVENUE CLEVELAND, OHIO. U.S.A.

FOR SALE BY

New York: A. H. Green & Co., 1686 Broadway
Boston: Mr. W. J. Forbes, 70 Long Wharf.
Philadelphia: Vail-Schaefer Co., 608 Arch St.
San Francisco: Weinstock-Nichols Co., 575 Golden Gate Ave.
Los Angeles: Weinstock-Nichols Co., 1216 S. Olive St.
Buffalo: J. W. Frey, 700 Main St.
Syracuse: Syracuse Rubber Co.
Portland, Oregon: Rober Machinery Co., 281 East Morrison St.
Kansas City: Kansas City Auto Supply Co.
Omaha: Powell Supply Co.
New Orleans: Interstate Electric Co., Baronne and Perdido Sts.
Canada: Canadian General Electric Co. **Toronto and Branches.**
Cincinnati: L. E. Bedinger, 311 Main St.

Covert Transmissions and Jackshafts for Commercial Trucks

are the product of ten years of careful and conscientious study and experimental work, and represent the highest degree of efficiency and reliability in transmission construction.

Covert Transmissions

have been used for several years with perfect satisfaction by many of the leading manufacturers.

Before deciding upon the specifications for your new models, let us show you in detail the many advantages of this combination.

Write for our descriptive booklet.

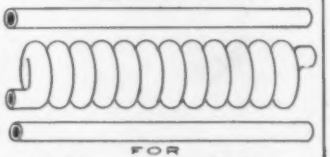
Covert Jackshafts

are made in several sizes for commercial cars and trucks ranging from ½-ton to 3-ton capacity.

COVERT MOTOR VEHICLE CO.

Transmission Specialists (The name "COVERT" on a transmission case is reliability insurance) LOCKPORT, NEW YORK

SEAMLESS
BRASS AND COPPER
TUBING



FOR
OIL AND GAS
PIPES

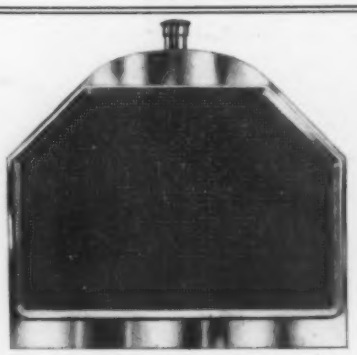
THE BUFFALO TUBE CO.

ERIE, PA.

Quality **Price**

Delivery

Best in the Business

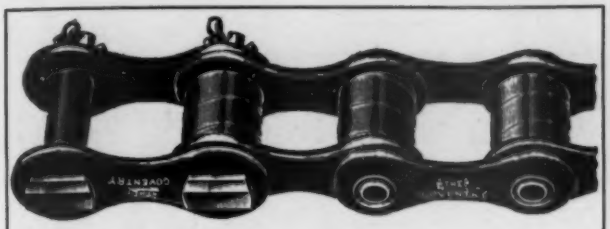


The Mayo—the radiator thoroughbred

¶ "Conservative Optimists"—that's us

¶ We believe there are enough good people going to continue to build, sell and buy good automobiles, to justify us in maintaining the high standard of Mayo Radiators

Mayo Radiator Co.
New Haven, Connecticut



You are doing yourself a great injustice if you do not try a pair of

"The Coventry"

Patent Roller Chains

on your commercial vehicle

They are made standard for all types and can be despatched upon receipt of wire or 'phone message. Their exclusive advantages can only be realized by actual experience—so order a pair to-day. The prices also are right.

Send for complete catalogue of

Noiseless Chains

SOLE UNITED STATES REPRESENTATIVES

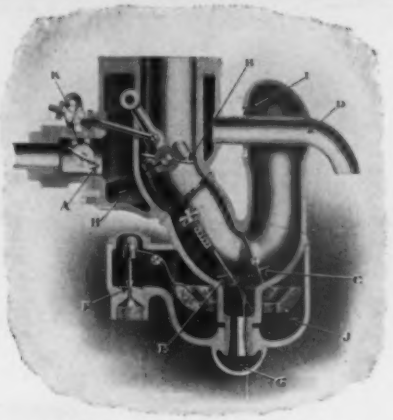
S. Hoffnung & Co., Ltd.

110 Broad Street :: :: NEW YORK

MARVEL CARBURETER

THE NAME DEFINES IT

THE COMMERCIAL CAR CARBURETER



MOTOR TRUCK OWNERS!

Frequent stops are necessary—the motor should idle at very low speed—if it chokes up—if it does not move at once without being stalled—it means a great waste of fuel.

THE MARVEL CARBURETER enables the driver to slow down at each stop, thereby causing a decided saving in fuel.

Get a MARVEL for ECONOMY, FLEXIBILITY, POWER.

Fuel today is half gasoline, half kerosene,—but the MARVEL CARBURETER, with its large heating jacket **under automatic control,** will meet this contingency, and vaporization will be easy.

Special models for standard cars.

Shall we send booklet?

MARVEL CARBURETER COMPANY

2234 N. Alvord Street Indianapolis, Indiana

SANBERT

MOTOR TRUCKS

Capacity One Ton. Price, $1500.00

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UNIT POWER PLANT

—FOR—

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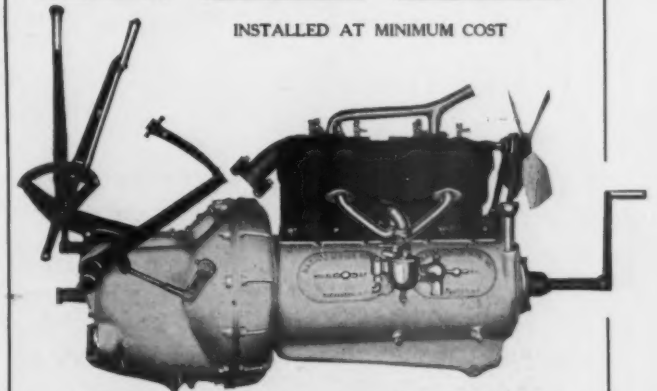

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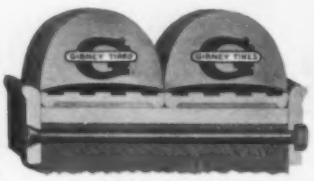

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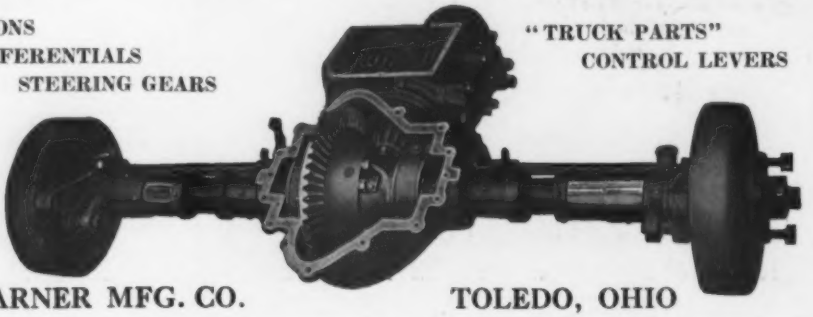

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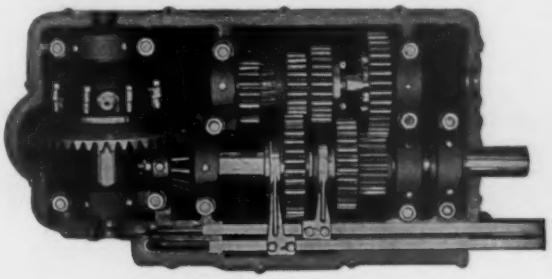

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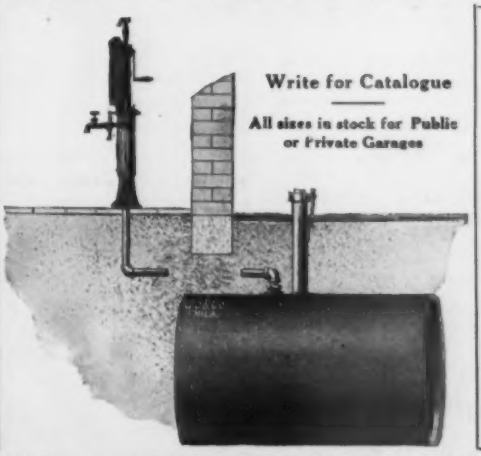

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